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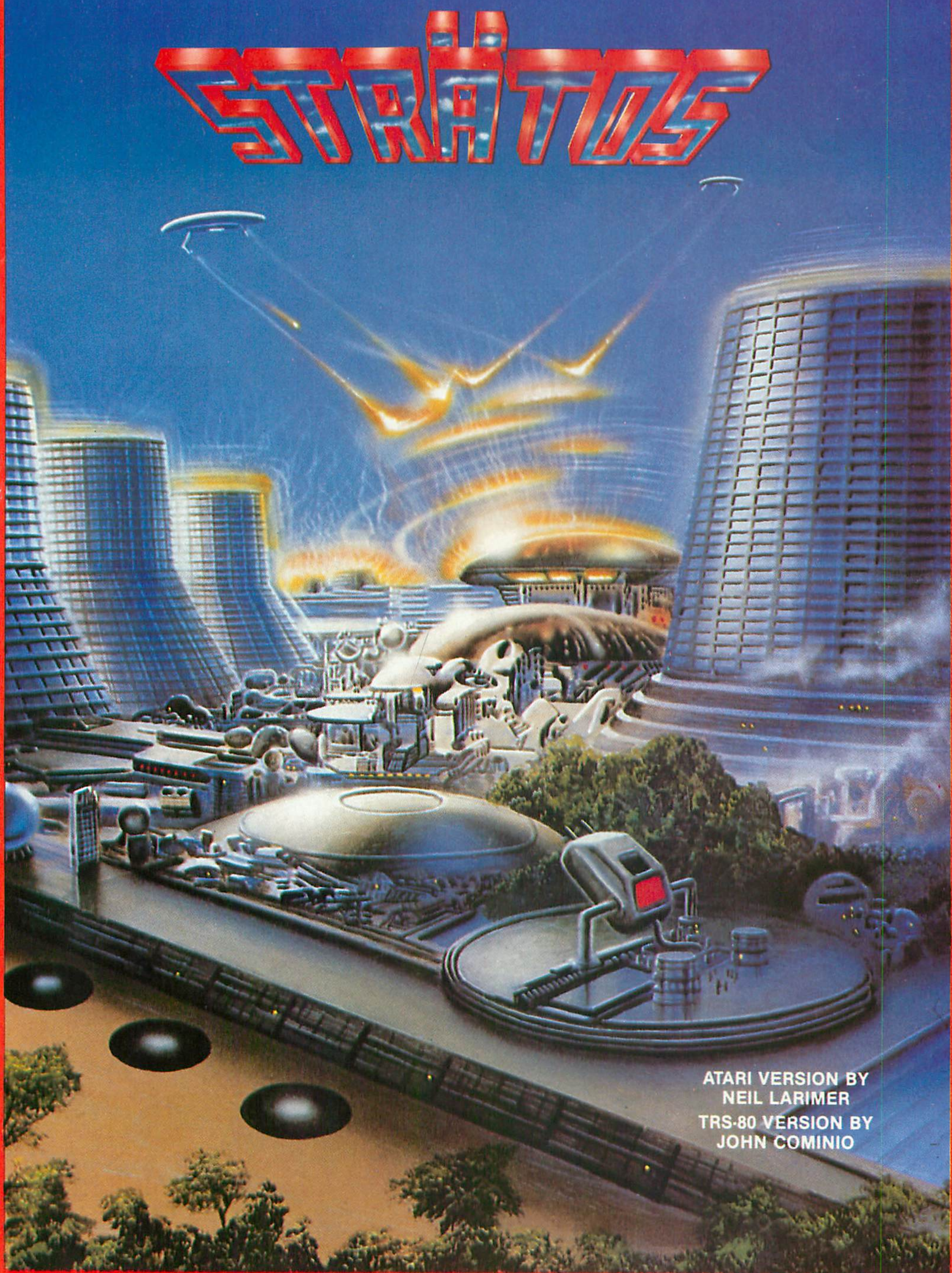
The ATARI® Resource

DECEMBER/JANUARY 1983, VOLUME 1, ISSUE 5

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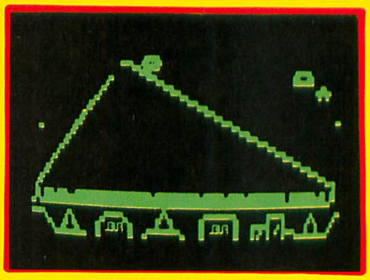
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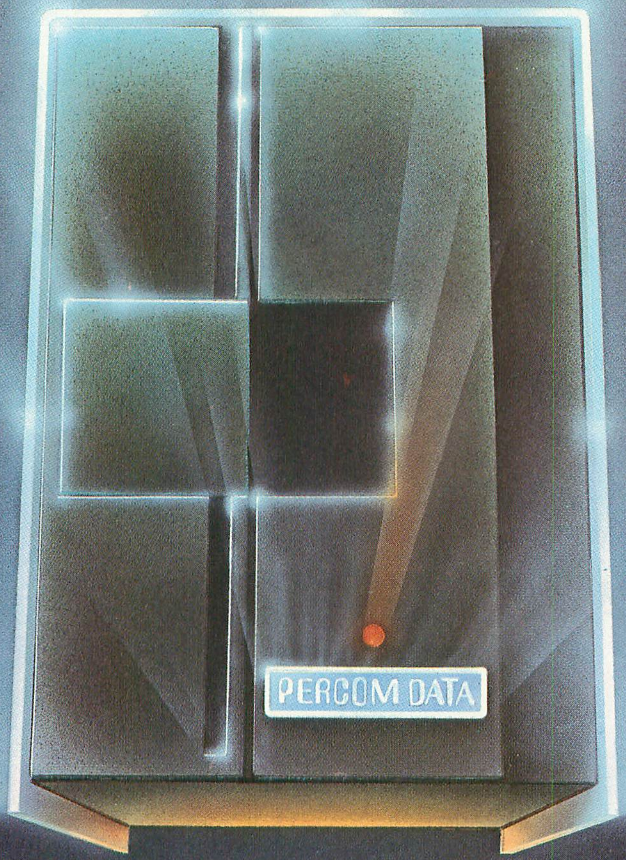
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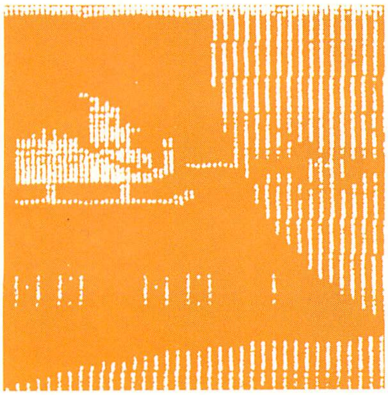
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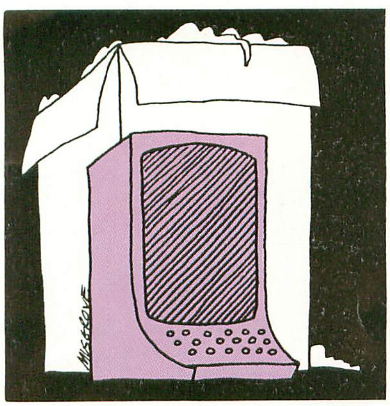
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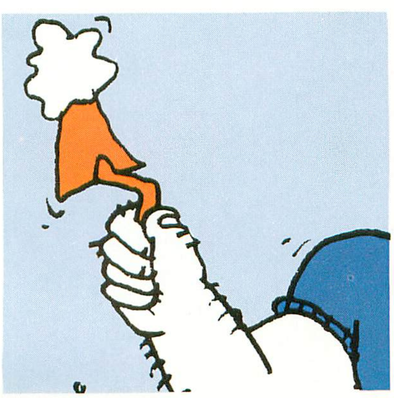
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FEATURES



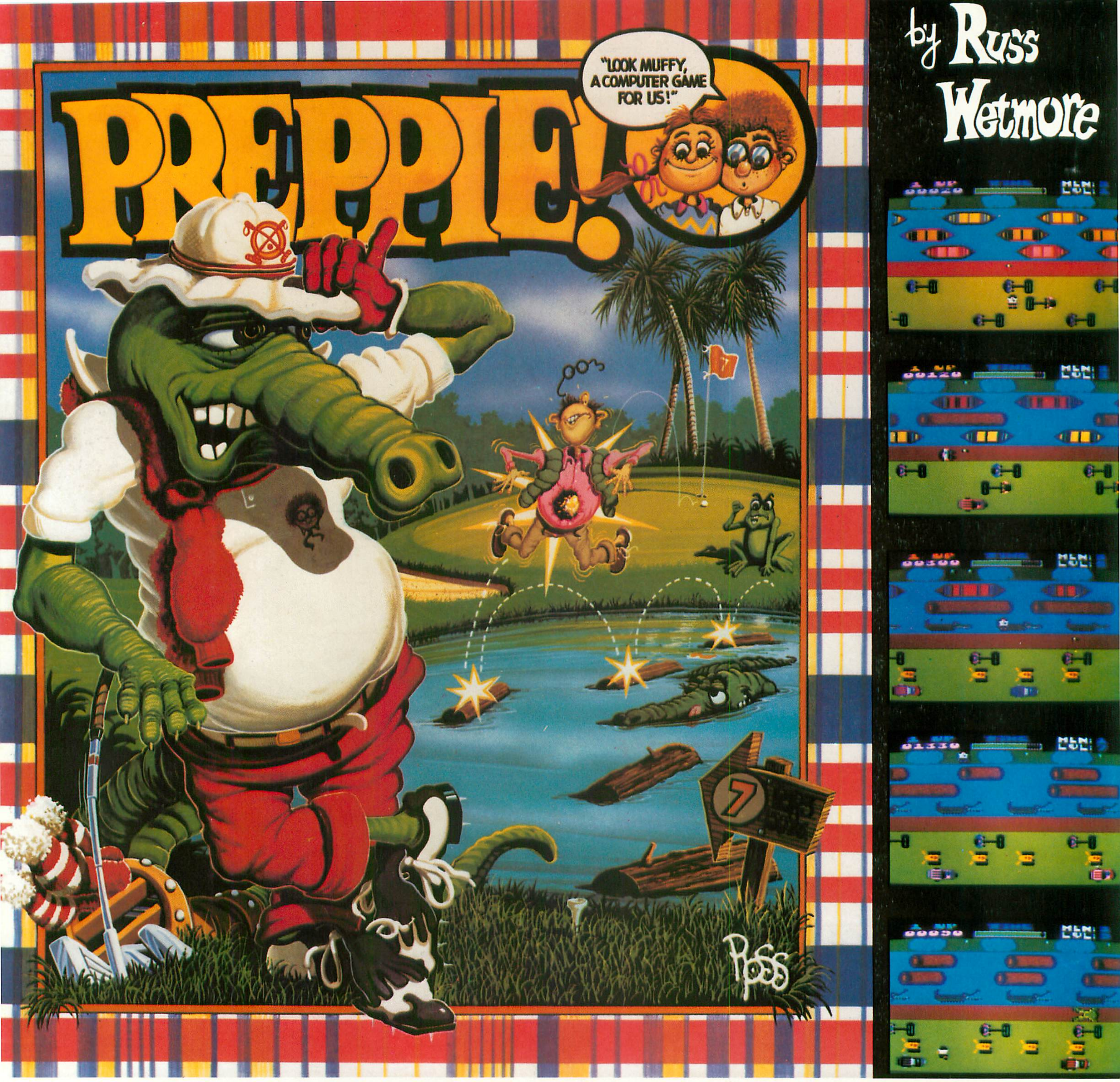
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—Holister Townsend Wolfe

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—Theodore Boston III

"I haven't had this much fun since Buffy and I went to Princeton for the weekend."
—Martha Vineyard

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I/O BOARD

S.O.S.

Revolutionary greetings, fellow ATARI users. I need help urgently here on this lonely island twelve degrees north of the equator. I am desperate for information about my ATARI computer (a rarity here) so I can help my students and the other staff at our medical school. Any information will be gratefully received.

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MSG RCVD STOP ONE-YEAR COMP SUBSCRIPTION ANTIC SENT ASAP STOP DESPAIR NOT —ANTIC ED

BACK ISSUES

My son bought ANTIC #3 at the store and enjoyed it so much he wants to subscribe, starting with #4. Can we also get the two back issues that he missed?

Mrs. Robert Schweizer
Canton, OH

Yes, back issues are available for $4.00 each, which includes immediate mailing upon receipt of payment. Master Charge and Visa orders are now honored. A special subscription offer begins this issue (see form at centerfold).—ANTIC ED

LINE NUMBER MISCUE

For some reason the line numbers referred to in the Music With BASIC article (ANTIC #4) don't agree with the listing. For example, the program does not "begin with GOTO 370." It begins with GOTO 310. What happened?

Larry Stark
Pawnee, OK

Sorry. We renumbered the listing without realizing there were line numbers referred to in the article. The count is off by fifty or sixty lines, depending on the instance. This does not affect program execution. —ANTIC ED

TUNER TROUBLE

I tried to type in "Tuning Your ATARI" (ANTIC #4), but line 70 threw me for a loop. How do you do that!

Mona Freeman
Glacier Park, WY

Line 70 has special graphics and inverse video characters which didn't print when we listed it on the ATARI 825. Update your listing with the following statements.

```
 70 GOSUB 700:TONE=430:
    WAIT=500
 95 DATA 104,162,4,160,0,177,
         205,145,203,200,208,
         249,230,206,230,204,
         202,208,242,96
700 FOR I=1 TO 20:READ MAC:
    P1$(I,I)=CHR$(MAC):NEXT
    I:RETURN
```

—ANTIC ED

RUNNER?

I want to complain about your advertiser, Frontrunner Computer Industries. Their program "Superclone" sounded good, so I sent a bank check. After several weeks, nothing. So I called, only to get an answering service. I waited several more weeks, and still nothing. At this point I just want my money back.

Eric Olsen
Yakima, WA

You are not alone. We have refused Frontrunner's ad pending resolution of our readers' compaints.—ANTIC ED

WORK WORK WORK

I plan to use my ATARI 800 primarily for business, and would like to see more about business applications in your magazine. While I'm aware that Atari, Inc. views its primary marketplace as the home, the superior capa-

continued on next page

bilities of the ATARI recommend it to businessmen like myself. Many of us will want to learn how to program the machine for our own particular applications.

Clark Nobil
Miami Beach, FL

We are planning a special issue on business applications for mid-1983. If you have programs or ideas that you think would be suitable, please let us know.—ANTIC ED

MEDIA REQUEST

Could you provide for us readers the option of obtaining your longer programs on "media" such as disk or tape? Many of us aren't such good typists.

Jim Rubins
Napa, CA

That's a strong possibility. Note our Public Domain Software offer in this issue does contain two of our long games. If and when we can offer other ANTIC listings on tape or disk we will announce it.—ANTIC ED

MEMORY VOYEUR

I would love to see what's loading into my computer's memory while it happens. Can it be done?

I'd also appreciate an article about formatting on an EPSON printer. I don't understand how the escape codes work with the ATARI.

James Springs
Kensington, MD

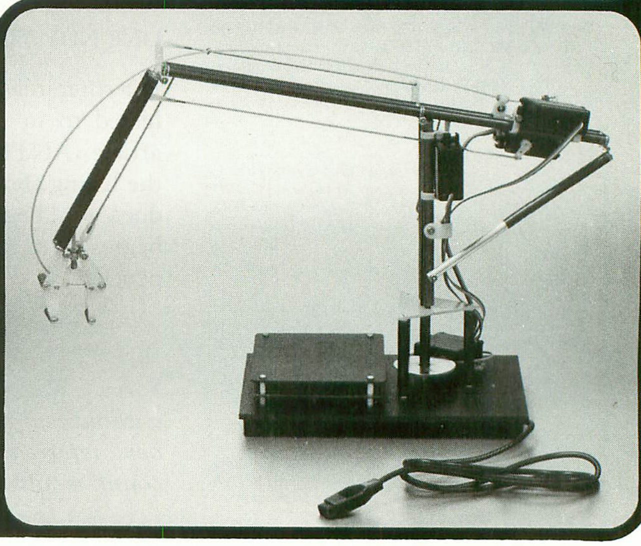
Each printer has its own set of control codes, although there is a similarity within a brand. Correspondence to the ATARI character set must be determined case by case. It is possible to "watch" memory, that's what the Display List is all about.—ANTIC ED

EDUCATIONAL NEED

I have two sons, eighth and ninth graders, for whom I'm seeking educational programs for the ATARI, that support reading, vocabulary, algebra, etc. Please add an educational column to your magazine to help us find good software.

Ed Valentine
Huntsville, AL

We're pursuing this, and you can expect more coverage in the future. Meanwhile note our review of Wordrace (vocabulary) in Issue #3, and our reviews of Speedread + (reading) and Big Math Attack (arithmetic) this issue—ANTIC ED

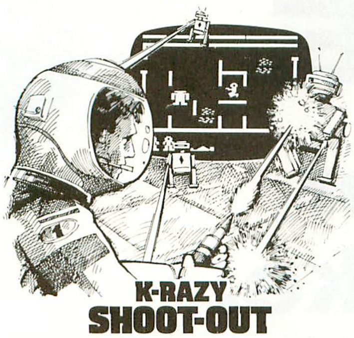


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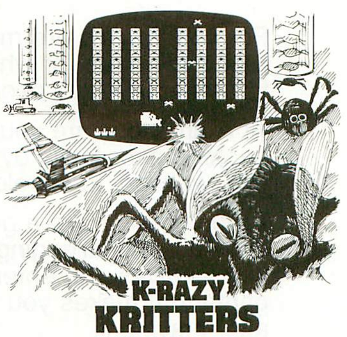
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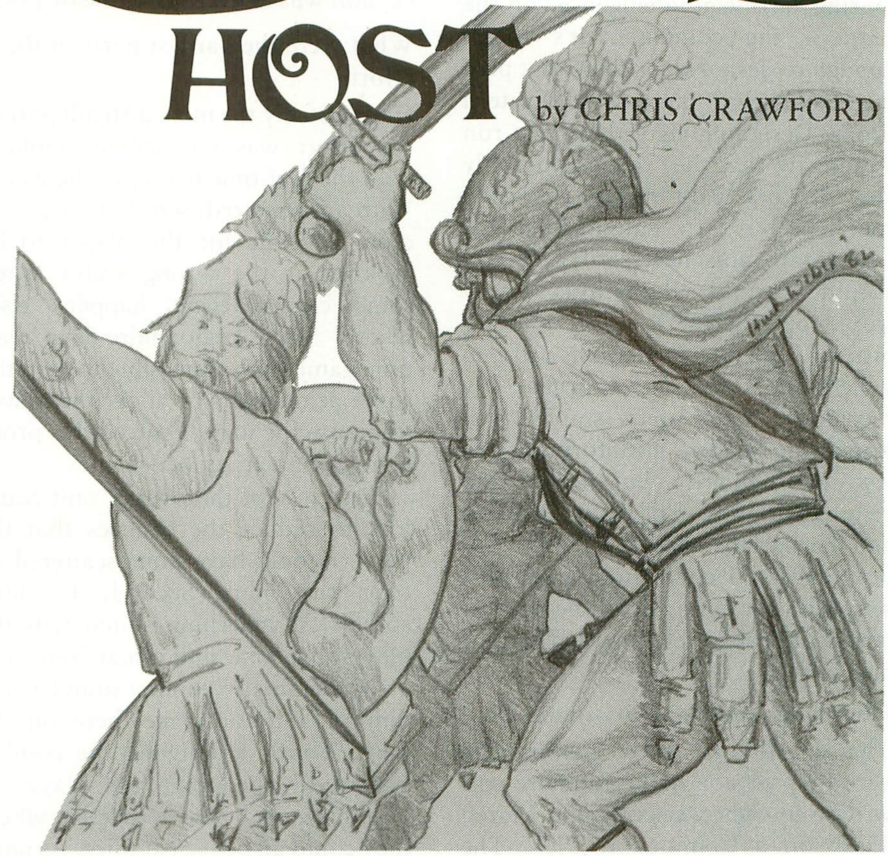
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GREAT CÆSAR'S HOST



by CHRIS CRAWFORD

LEGIONNAIRE is my latest computer game, a war game manufactured by the Avalon-Hill Game Company. It is a real-time game of tactical combat between Romans and barbarians in the time of Caesar. The player takes the role of Caesar, commanding up to ten Roman legions against a variety of barbarian tribes.

I also wrote a war game called **Eastern Front 1941**, published by APX, that is strategically more complex, but similar in many respects to **Legionnaire**. Since ANTIC asked me to write a bit about game design, I thought these two efforts could serve as useful examples.

Eastern Front pits the Nazi Germans against the Russian armies on a realistic map of eastern Europe. The player commands the Germans and controls unit strength, deployment and movement, while the computer controls the Russians. The "map", or playfield, is several times the size of the screen, which serves as a "window" on the map. The player views the remote parts of the map by "scrolling", or moving the joystick so the screen window appears to move across the map.

The design advantage of the big map is to allow much more detail and variation within the playfield, and therefore, more playability. The visual effect of scrolling is handsome as well. The disadvantage is that "action" can be taking place on parts of the map invisible, for the moment, to the player. It can be argued that this realistically simulates the commander's condition and enhances the game, but it causes problems, too, especially when the technique is applied to a game like **Legionnaire**.

How does Legionnaire differ from Eastern Front?

The biggest difference between the two games is that **Legionnaire** is a real-time game where **Eastern Front** is a turn-sequenced game. Thus, you have plenty of time to think over your moves in **Eastern Front**, but **Legionnaire** does not give you this luxury. The pace is slow enough to give you some time to plan your move, but not so slow that you can relax. In the heat of the battle, you must be able to rethink your plans very quickly; there is very little time for reflection at the moment of truth. For this reason I think that **Legionnaire** is a less cognitive game than **Eastern Front**. I also think that it is a fundamentally more exciting game that **Eastern Front**. It is not as meaty a game; and war gamers may feel that it doesn't have enough strategic subtlety.

The basic game system is much the same as **Eastern Front**. There's the scrolling map with terrain, and you give orders to units in much the same way. Movement and combat follow a roughly similar pattern.

With **Legionnaire**, however, the scale of the playfield is much smaller. Instead of thousands of square miles of territory, we have perhaps a hundred. The terrain has variously-pitched hills, and the pitch affects movement of player and foe. There are forests, impenetrable to both sides. Each START places all forces in new locations, so each battle is tactically unique.

As Caesar, the player gives "orders", using the joystick, that cause the legions to move specifically and separately in complex attack patterns. In a well-played game of **Legionnaire**, Caesar's units will be moving *simultaneously* in real time to close battle with an enemy similarly moving.

The graphics of **Legionnaire** are slightly better. Units are displayed more imaginatively. There's a little more color. I also added some animation to show which units are moving where during the turn. It is safe to say that **Legionnaire** goes beyond **Eastern Front** in its use of the technical capabilities of the ATARI computer.

continued on next page

Why a game on Romans and barbarians?

Simple. This is a real-time game requiring "artificial intelligence" on the part of the computer. It's tough enough to design algorithms that produce intelligent play, as in **Eastern Front**. Designing algorithms that run so quickly that they don't noticeably slow down a real-time game is really tough. Thus, the algorithms for **Legionnaire** must necessarily be pretty stupid. Stupid algorithms imply stupid opponents. In all of military history, how many situations arose in which one opponent was generally recognized to be pretty stupid? Not just wrong-headed, misinformed, gutless, or foolhardy, but deeply and genuinely dumb? Not many. Romans and barbarians was the closest approximation I could find. Even this scenario isn't quite fair to the barbarians, but fortunately, few barbarians buy software.

How long did it take to program?

That question is hard to answer. The very first version of **Legionnaire** was written in eight weeks around March 1979, on a Commodore PET. The game was fun but it didn't seem to hit the nail on the head. I sold fewer than a hundred copies. Rob Zdybel of Atari saw the game, liked it, and put together a simplified version for the ATARI 800. This was subsequently released by APX as the game **Centurion**. Subsequently, I joined Atari and attempted to interest the company in war games, but to no avail. So, in June, 1980, I signed a contract with Avalon-Hill giving them the rights to **Tanktics** and **Legionnaire**.

By September, 1981, I had finished work on **Eastern Front** and was casting about for a new project. Avalon-Hill had been impressed with **Eastern Front** and wanted something like it, so I promised that I would get to work on an adaptation of **Legionnaire** for them. I spent three months solving some of the fundamental problems with the game, then began serious programming work in January of 1982. I delivered the game to Avalon-Hill in late February. Polishing required three more months. The final version was delivered in June of 1982.

What were the hardest parts of the effort?

Undoubtedly the most difficult part of the effort was reconciling scrolling with the real-time nature of the game. With an oversized, scrolling map, it is quite possible for the player to be looking at the wrong sector when some crucial event happens elsewhere. Since **Legionnaire** is a real-time game, it is impossible to stop the game at intervals to allow the player to peruse the map. I solved this problem with a variety of schemes.

First, I kept the overall unit count low to reduce the chances that the player would have units scattered all over the map. Second, I added sounds. A marching sound tells the player that some unit is marching, and a very distinctive combat sound warns him of a battle somewhere on the map. Third, I designed the combat system to encourage the player to keep his units bunched together where they could all be seen at once. As units march, their fighting strength wanes, and when combat is joined, unit strength falls due to death and injury. Holding high ground is an advantage. These features make it desirable for Caesar to keep his legions together, march them as little as possible, and hold the high ground.

I think I was successful; but this problem, which kept me awake at night during the design phase, is rarely mentioned by people who play the game.

Another big problem arose from the real-time nature of the game. The player's input is processed during the Vertical Blank Interrupt; while the units are moved during the mainline execution. With **Eastern Front** it was quite possible to keep the two processes separated so that they would never interfere with each other, but with **Legionnaire** it was far more difficult. For example, what if the mainline routine wants to move a unit that the player has picked up and is holding? Does it rudely jerk the unit out of the player's hands and move it, or does it politely wait, hanging-up the game while the yokel stares at his unit? I eventually devised a scheme that resolved the dilemma, but it cost me several tufts of hair.

What was the easiest part of the effort?

Working with the Atari Macro-Assembler, a magnificent piece of software. I programmed **Eastern Front** with the Atari Assembler Editor cartridge. Those who have read the source code of **Eastern Front** can testify to its clumsiness. By contrast, working with the Macro-Assembler was a real joy. I only wish that I had had Jim Dunion's DDT debugger then. The combination of the Macro-Assembler, DDT, a RAMDISK, and a good printer makes Assembly Language development a very smooth process.

If I had it to do over again, what would I change?

Very little. I find that the game plays smoothly and well. I wish I could have added some better sounds — those marching feet do get tiresome after a while. I have a vague feeling that **Legionnaire** doesn't have the staying power **Eastern Front** has, but I can't put my finger on the problem. It could be that **Legionnaire**, with only ten Roman units maximum, just can't match the sweep and scale of **Eastern Front**. I don't know.

Will it sell?

I think so. The biggest marketing problem with the original **Eastern Front** is that it is too cerebral, too strategic in nature. Those not used to war games have difficulty adjusting to the APX version. **Legionnaire** does not have this problem. It is much easier for a beginner to understand, and much more exciting to play than **Eastern Front**. But there's no way to be sure. Only time and the customers will tell.

ATARI TREE

by JERRY WHITE

I've figured out a way to send you all a Christmas card, and get ANTIC to pay for the postage. It's a BASIC program, which will serve as a kind of singing telegram. After you type it in and run it, you will see how to customize it for your own use.

The program demonstrates multicolor graphics as it displays a Christmas tree complete with colorful ornaments. It will play Jingle Bells in four-part harmony, display the lyrics, and change the color of the ornaments at the same time, using only Atari BASIC.

There are no USR instructions and no interrupt-driven machine language routines. Sound impossible? I think it's pretty good myself.

When you enter this program, be sure to enter line 20 first. It is important that the string variable PM$ be defined before anything else.

You can experiment with the program by changing the "player" ornaments, but you will have to erase the old ones first. You can do this in direct (immediate) mode by entering the following as a continuous logical line:

PMADR = (PM$):FOR ERASE = 0 TO 1023:POKE PM + ERASE,0:NEXT ERASE

Your ATARI computer has extensive sound capability. Music and an incredible range of sound effects are available even in BASIC. Those of you interested in learning more about writing computer music and using sound effects, may refer to the many articles and products featured in ANTIC #4.

```
  20 GRAPHICS 7:DIM PM$(2048
     ),PLL$(5),PLR$(5),WORD$
     (40):GOSUB 2000:GOTO 30
     0
 100 POKE 20,0:POKE 53760,V0
     :POKE 53762,V1:POKE 537
     64,V2:POKE 53766,V3
 101 IF V0=0 THEN 110
 102 POKE 704,V0:POKE 705,V1
     :POKE 706,V2:POKE 707,V
     3
 110 IF PEEK(20)<HOLD THEN 1
     10
 120 POKE 53760,0:POKE 53762
     ,0:POKE 53764,0:POKE 53
     766,0
 130 POKE 704,14:POKE 705,14
     :POKE 706,14:POKE 707,1
     4:RETURN
 300 READ V0,V1,V2,V3,HOLD,S
     WITCH,WORD$
 340 IF SWITCH=9 THEN 9500
 350 TRAP 360:IF TIMES=1 AND
      WORD$="DASHING THRU" T
     HEN 9000
 360 IF WORD$="*" OR SWITCH=
     2 THEN 400
 380 ? CHR$(125),WORD$:GOSUB
      100:GOTO 300
 400 GOSUB 100:GOTO 300
 600 DATA 47,60,81,96,19,1,J
     INGLE BELLS
 610 DATA 47,60,81,96,19,0,*
 620 DATA 47,60,81,96,29,0,*
 625 DATA 0,0,0,0,9,2,REST
 630 DATA 47,60,81,96,19,1,J
     INGLE BELLS
 640 DATA 47,60,81,96,19,0,*
 650 DATA 47,60,81,96,29,0,*
 655 DATA 0,0,0,0,9,2,REST
 660 DATA 47,60,81,96,19,1,J
     INGLE
 670 DATA 40,47,60,81,19,0,*
 680 DATA 60,81,96,121,29,1,
     ALL THE WAY
 690 DATA 53,53,108,108,9,0,
     *
 700 DATA 47,60,81,96,79,0,*
 710 DATA 0,0,0,0,9,2,REST
 720 DATA 45,60,72,91,19,1,O
     H WHAT FUN
 730 DATA 45,60,72,91,19,0,*
 740 DATA 45,60,72,91,29,0,*
 750 DATA 45,60,72,91,9,1,IT
      IS TO RIDE
 760 DATA 45,60,72,91,19,0,*
 770 DATA 47,60,81,96,19,0,*
 780 DATA 47,60,81,96,19,0,*
 790 DATA 47,60,81,96,9,0,IN
      A ONE HORSE
 800 DATA 47,60,81,96,9,0,*
 810 DATA 47,60,81,96,19,0,*
 820 DATA 53,64,81,108,19,0,
     *
 830 DATA 53,64,81,108,19,1,
     OPEN SLEIGH
 840 DATA 47,60,81,96,19,0,*
 850 DATA 53,64,81,108,39,0,
     *
 855 DATA 0,0,0,0,4,2,REST
 860 DATA 40,47,60,162,39,0,
     *
 870 DATA 0,0,0,0,4,2,REST
 900 DATA 47,60,81,96,19,1,J
     INGLE BELLS
 910 DATA 47,60,81,96,19,0,*
 920 DATA 47,60,81,96,29,0,*
 925 DATA 0,0,0,0,9,2,REST
 930 DATA 47,60,81,96,19,1,J
     INGLE BELLS
 940 DATA 47,60,81,96,19,0,*
 950 DATA 47,60,81,96,29,0,*
 955 DATA 0,0,0,0,9,2,REST
 960 DATA 47,60,81,96,19,1,J
     INGLE
 970 DATA 40,47,60,81,19,0,*
 980 DATA 60,81,96,121,29,1,
     ALL THE WAY
 990 DATA 53,53,108,108,9,0,
     *
 992 DATA 47,60,81,96,79,0,*
 994 DATA 0,0,0,0,9,2,REST
1000 DATA 45,60,72,91,19,1,O
     H WHAT FUN
1010 DATA 45,60,72,91,19,0,*
1020 DATA 45,60,72,91,29,0,*
1030 DATA 45,60,72,91,9,1,IT
      IS TO RIDE
1040 DATA 45,60,72,91,19,0,*
1050 DATA 47,60,81,96,19,0,*
1060 DATA 47,60,81,96,19,0,*
1070 DATA 47,60,81,96,9,1,IN
      A ONE HORSE
1080 DATA 47,60,81,96,9,0,*
1090 DATA 40,53,64,81,19,0,*
1100 DATA 40,53,64,81,19,0,*
1110 DATA 45,53,64,81,19,1,O
     PEN SLEIGH
1120 DATA 53,64,81,108,19,0,
     *
```

continued on next page

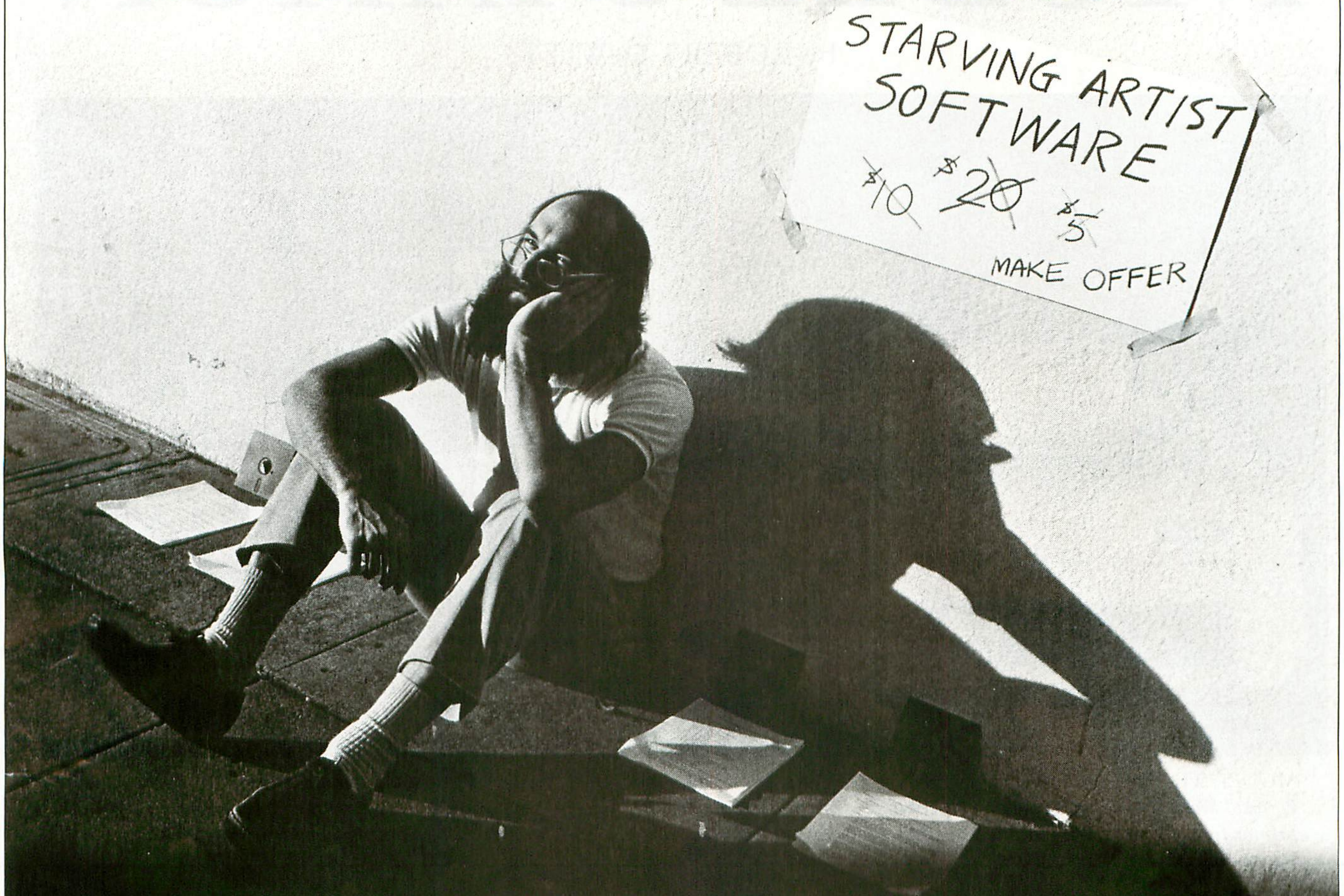
```
1130 DATA 60,81,96,121,79,0,
     *
1140 DATA 0,0,0,0,9,2,REST
1200 DATA 81,96,121,162,19,1
     ,DASHING THRU
1210 DATA 47,47,96,96,19,0,*
1220 DATA 53,53,108,108,19,0
     ,*
1230 DATA 60,60,121,121,19,1
     ,THE SNOW
1240 DATA 81,96,121,162,59,0
     ,*
1245 DATA 0,0,0,0,9,2,REST
1250 DATA 81,96,121,162,9,1,
     IN A ONE HORSE
1260 DATA 81,96,121,162,9,0,
     *
1270 DATA 81,96,121,162,19,0
     ,*
1280 DATA 47,47,96,96,19,0,*
1290 DATA 53,53,108,108,19,1
     ,OPEN SLEIGH
1300 DATA 60,60,121,121,19,0
     ,*
1310 DATA 72,91,121,144,79,0
     ,*
1320 DATA 0,0,0,0,9,2,REST
1330 DATA 72,91,121,144,19,1
     ,OVER THE FIELDS
1340 DATA 45,45,91,91,19,0,*
1350 DATA 47,47,96,96,19,0,*
1360 DATA 53,53,108,108,19,1
     ,WE GO
1370 DATA 64,81,108,128,79,0
     ,*
1380 DATA 0,0,0,0,9,2,REST
1390 DATA 40,47,60,81,19,1,L
     AUGHING
1400 DATA 40,47,60,81,19,0,*
1410 DATA 45,45,91,91,19,1,A
     LL THE WAY
1420 DATA 53,53,108,108,19,0
     ,*
1430 DATA 47,60,81,96,79,0,*
1440 DATA 0,0,0,0,9,2,REST
1500 DATA 81,96,121,162,19,1
     ,BELLS ON BOB
1510 DATA 47,47,96,96,19,0,*
1520 DATA 53,53,108,108,19,0
     ,*
1530 DATA 60,60,121,121,19,1
     ,TAILS RING
1540 DATA 81,96,121,162,79,0
     ,*
1545 DATA 0,0,0,0,9,2,REST
1550 DATA 81,96,121,162,19,1
     ,MAKING SPIRITS
1560 DATA 47,47,96,96,19,0,*
1570 DATA 53,53,108,108,19,0
     ,*
1580 DATA 60,60,121,121,19,0
     ,*
1590 DATA 72,91,121,144,79,1
     ,BRIGHT
1600 DATA 0,0,0,0,9,2,REST
1610 DATA 72,91,121,144,9,1,
     WHAT FUN IT IS
1620 DATA 72,91,121,144,19,0
     ,*
1630 DATA 45,45,91,91,19,0,*
1640 DATA 47,47,96,96,19,0,*
1650 DATA 53,53,108,108,19,1
     ,TO RIDE AND SING
1660 DATA 40,53,64,81,19,0,*
1670 DATA 40,53,64,81,19,0,*
1680 DATA 40,53,64,81,29,0,*
1700 DATA 40,53,64,81,9,1,A
     SLEIGHING
1710 DATA 35,35,72,72,9,0,*
1720 DATA 40,53,64,81,19,0,*
1730 DATA 45,45,91,91,19,1,S
     ONG TONITE
1740 DATA 53,53,108,108,19,0
     ,*
1750 DATA 60,81,96,121,79,0,
     *
2000 POKE 752,1:POKE 559,62:
     I=PEEK(106)-32:POKE 542
     79,I:POKE 623,33
2040 VTAB=PEEK(134)+PEEK(135
     )*256
2050 ATAB=PEEK(140)+PEEK(141
     )*256
2060 OFFS=I*256+1024-ATAB
2070 HI=INT(OFFS/256):LO=OFF
     S-HI*256
2090 POKE VTAB+2,LO:POKE VTA
     B+3,HI:GOTO 10000
8000 DATA 0,0,0,0,0,9,END
9000 POKE 201,10:? CHR$(125)
     ," MERRY CHRISTMAS":? ,
     "from Jerry White":? ,"
     & ANTIC Magazine"
9200 FOR HOLD=0 TO 231 STEP
     0.5:POKE 704,HOLD:POKE
     705,HOLD+8:POKE 706,HOL
     D+16:POKE 707,HOLD+24:N
     EXT HOLD
9300 GOSUB 20000:POKE 53277,
     0:GRAPHICS 0:END
9500 TIMES=TIMES+1:FOR HOLD=
     1 TO 40:NEXT HOLD:RESTO
     RE :GOTO 300
10000 PLL$(1,1)=CHR$(32):PLL$
     (2,2)=CHR$(112):PLL$(3,
     3)=CHR$(248):PLL$(4,4)=
     PLL$(2,2):PLL$(5,5)=PLL
     $(1,1)
10003 PLR$(1,1)=CHR$(4):PLR$(
     2,2)=CHR$(14):PLR$(3,3)
     =CHR$(31):PLR$(4,4)=PLR
     $(2,2):PLR$(5,5)=PLR$(1
     ,1)
10004 FOR ME=70 TO 150 STEP 2
     0:PM$(ME+256,ME+260)=PL
     R$:PM$(ME+266,ME+270)=P
     LL$
10005 PM$(ME+512,ME+516)=PLR$
     :PM$(ME+522,ME+526)=PLL
     $:NEXT ME
10006 PM$(114,118)=PLR$:PM$(1
     34,138)=PLR$:PM$(154,15
     8)=PLL$
10007 PM$(882,892)=PLL$:PM$(9
     02,906)=PLL$:PM$(922,92
     6)=PLR$
10008 POKE 708,196:POKE 710,6
     5:POKE 712,14:POKE 709,
     72:POKE 201,15:POKE 65,
     0:POKE 82,2:? :GOSUB 20
     000
10009 SOUND 0,0,0,0:POKE 5376
     1,168:POKE 53763,164:PO
     KE 53765,164:POKE 53767
     ,164
10010 POKE 765,1:FOR X=2 TO 6
     :A=8*X+80:B=11*X:C=80-8
     *X
10020 COLOR 1:PLOT 81,9:PLOT
     A-16,B-13:DRAWTO A,B:PL
     OT C-1,B+1
10030 POSITION C+16,B-13:XIO
     18,#6,12,0,"S:"
10040 COLOR 2:PLOT A,B:DRAWTO
      A-1,B+1:PLOT C,B:DRAWT
     O C+1,B+1:DRAWTO C-1,B+
     1
10042 PLOT A,B+1:DRAWTO A+1,B
     +1:NEXT X
10050 COLOR 0:PLOT 81,9:COLOR
      3:POKE 765,3:PLOT 90,6
     7
10060 DRAWTO 90,79:DRAWTO 70,
     79:POSITION 70,67:XIO 1
     8,#6,12,0,"S:"
10070 COLOR 2:POKE 765,2:PLOT
      80,1:DRAWTO 85,10:DRAW
     TO 83,9
10080 POSITION 74,4:XIO 18,#6
     ,12,0,"S:":DRAWTO 86,4:
     DRAWTO 75,10
10090 DRAWTO 80,1:DRAWTO 80,5
     :DRAWTO 76,9:PLOT 83,5:
     POKE 201,13:POKE 53277,
     2
11000 POKE 53248,102:POKE 532
     49,116:POKE 53250,132:P
     OKE 53251,146:RETURN
20000 FOR ME=53248 TO 53251:P
     OKE ME,0:NEXT ME:RETURN
```

TYPO TABLE

Variable checksum = 501561

Line num range	Code	Length
20 - 360	QS	522
380 - 670	BC	324
680 - 790	WS	331
800 - 920	LG	308
925 - 1000	YU	320
1010 - 1120	JQ	321
1130 - 1280	WU	328
1290 - 1400	IW	332
1410 - 1560	JC	339
1570 - 1680	GY	330
1700 - 2090	QK	435
8000 - 10000	PC	502
10003 - 10008	GZ	611
10009 - 10050	IF	565
10060 - 20000	NO	510

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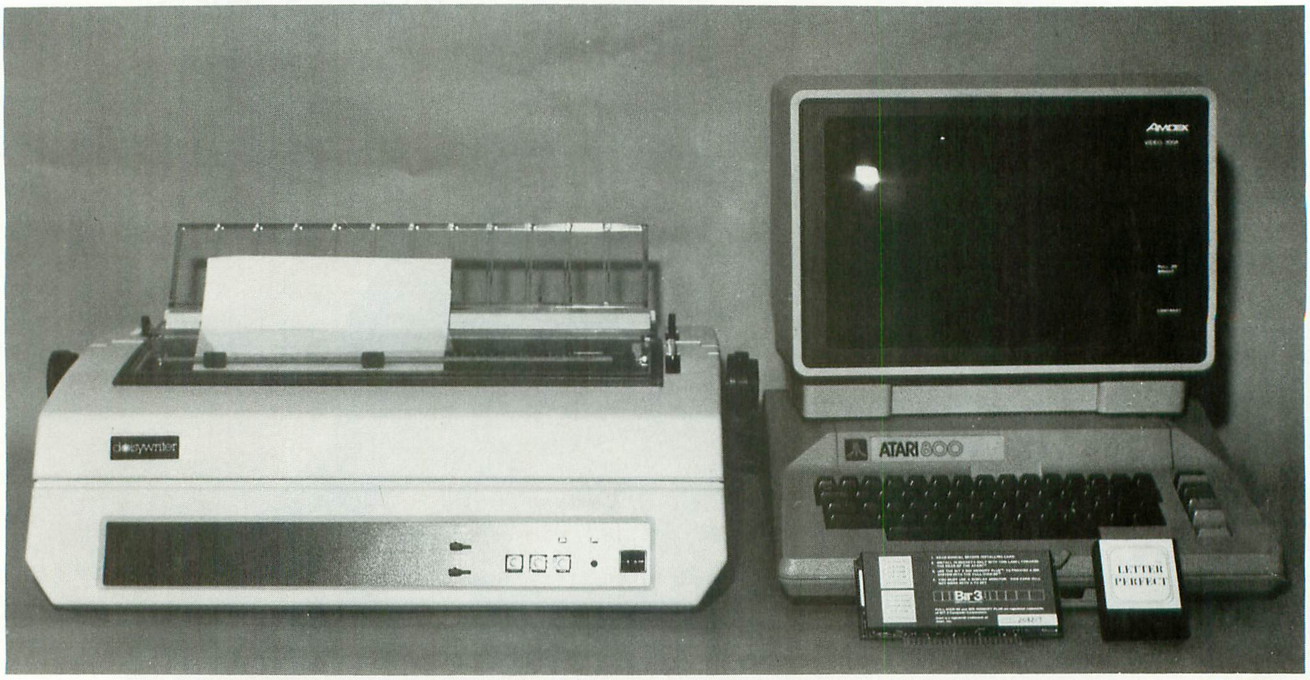
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MODEL STATION

by ROBERT DEWITT



MODEL WORD PROCESSING STATION — The ATARI 800 with 48K RAM, the Full View 80-Column Board by Bit3, LJK's "Letter Perfect" Word-Processing Program (80-column cartridge version), Amber Screen Monitor by Amdek, and the Daisywriter letter-quality printer from Computers International. Percom double-density disk drives were also used, although in single-density mode.

Word processing is replacing typing in many modern offices. Other word-oriented workers are beginning to use it too. People who own computers are turning to word processing for professional and personal writing chores, so every brand of computer seems to offer it to some degree. ATARI is no exception, and several of the word-processing programs available for it were surveyed in ANTIC #1.

Still, word processing on the ATARI has not been one of this machine's strongest features. The worst problem was the 40-column screen format. This only gives the writer about half of the line width of the normal printed page. One solution used the 40-column by 24-line screen as a "window" on a much wider and longer "page" held in memory, across which the window is moved. This is barely tolerable for a person who composes or formats while writing. Another approach "wrapped" the composition approximately at column 40. This allows the writer to see all of the most recent 24 lines of writing, but gives no sense of formatting. Other problems included the fuzziness of the typical TV screen when producing text, and the glare from the full-color display.

THE MODEL SYSTEM

Some recent developments have greatly improved the performance of the ATARI computers as word-processing machines. Even the 400 is coming within the pale by virtue of memory expanders and add-on keyboards (see Product Reviews this issue). ANTIC decided to assemble a number of products into a model word-processing system for the ATARI. The products gathered here comprise perhaps the least-expensive, most nearly professional, word-processing system on the market. The hardware described here gives the user 80 columns of type on an amber-screen monitor. The software, and daisywheel printer produce letter-quality documents suitable for professional use.

THE COMPUTER

We used the standard ATARI 800 computer with 48K RAM. It isn't necessary to have that much memory, but the more memory you have, the more of your document you can access without resorting to disk. The minimum RAM required for the word-processor program itself is 24K. If you do not expand memory in this setup, you must leave the last RAM slot of the 800 open for the Bit3 80-column board. In our system we achieved 48K RAM by using a 16K Atari RAM board and a 32K expansion board from Intec Peripherals, Inc. ($90).

Full-View 80 Board

Bit3 Computer Corp.
8120 Penn Avenue South, Suite 548
Minneapolis, MN 55431
$349.00

While we have the cover off the computer, let's discuss the 80-column board. This item was the key to making this system work. The board plugs into the last RAM slot and has cables that extend out the back of the ATARI case. One plug goes to the monitor, and the other to the monitor jack of the computer. The card will not work with a regular TV set. It requires a monochromatic monitor.

This board generates an 80-column-per-line display, twice the normal number. All the standard ATARI text and graphics modes are still available, under keyboard or program control. The board keeps its own display memory, therefore there is no minimum ATARI memory requirement. The board may be used without a disk drive (though not in this setup) and will work with a BASIC cartridge or Microsoft BASIC. The displayed characters are contained in an 8 x 10 dot-matrix cell. These characters are easy to read and make word processing an easier task. The manual with this product provides information necessary to use the board with a wide variety of software. The only word-processing program currently compatible with this 80-column format is LJK's Letter Perfect.

Letter Perfect

LJK Enterprises, Inc.
P.O. Box 10827
St. Louis, MO 63129
$149.95 ($199 for cartridge)

This company produced the first word-processing program available for the ATARI, and now has brought out an improved version available in cartridge and disk. The program comes in both 80-column and 40-column versions. An important addition to Letter Perfect is its ability to use any printer. This is done with a special editor that allows you to enter the printer's control-code table. Letter Perfect also permits using special control characters in the text stream, but which will not print out. This program is compatible with the Data Perfect program, also from LJK. Used together, information from the data base can be inserted into text stream, as, for example, addresses into a form letter. Letter Perfect requires 16K RAM.

Daisywriter Printer

Computers International
3540 Wilshire Blvd.
Los Angeles, CA 90010
$1,395.00

This new printer has so many features it is the most flexible printer available for the ATARI. It boasts an interchangeable daisywheel so that many type faces can be used. Most importantly, this printer can emulate many different printers, including the ATARI 825. Built into every Daisywriter is a 16K buffer. This allows the word processor to dump data faster, reducing the time the operator must wait before using the program again. Paper handling is straightforward and works well. This printer handles single-sheet paper, or fan-fold, using the optional tractor feed. The controls are flexible and easy to access. Lines per page, pitch, line spacing, line feed and top-of-form controls are all available on the front panel. A special ATARI cable is available at extra cost. The printer can also be purchased with a 48K buffer. The printer can emulate Qume, NEC, ATARI 825, and Diablo. About the only problem with this printer is that with all the built-in flexibility, it takes a little extra study to get maximum advantage from it.

Cassette owners are not entirely out in the cold when it comes to word processing. ACCU / WRITE is a cassette-based word processor requiring 16K and an Epson printer. A Centronics version is in development. ACCU/ WRITE can format lines up to 80 characters long, and can create multiple-page documents with each page saved to tape. ANTIC expects to review this product in depth in a future issue.

Available from: DPH Inc., Suite 705
1700 Stumph Blvd.
Gretna, LA 70053
(504) 361-8594
Price: $20.00

Amber Monitor

Amdek
2420 E. Oakton St.
Arlington Hts., IL 60005
$310.00

The Full-View 80 board will only work with a monochromatic video monitor. A color monitor, or a monocromatic TV will not suffice. A monitor is different from a TV receiver in that it has no RF tuner, and can't receive any signals over the air. Signals must be delivered by wires connecting the monitor with the signal source (in this case the computer). Monitors are much less susceptible to interference, so they have a clearer, more stable image. Monochromatic monitors have only one color. White, green and amber have been used recently, and amber seems to be easiest on the eyes. Our model station uses the Amdek 300-A (amber screen). Controls are limited to brightness, contrast, vertical and horizontal alignment. This monitor has no speaker, so users forfeit the familiar sounds of reading and writing to disk or cassette, and the "clicks" representing keystrokes. The monitor screen is textured to reduce glare.

These products, used together, comprise a system for word processing that approaches the capabilities of "dedicated" systems costing much more. We used the system to write this, and several other articles for this issue of ANTIC, and are finding it essentially satisfactory. As with any computer situation, it has its limitations and idiosyncracies, but we think it will function just fine.

HOLIDAY CROSSWORD

by BETH KAPLAN

Crossword Magic is a program that will generate crossword puzzles using words and clues you provide. This program is easy, although it is not without its faults. At first glance, I found the instructions confusing; but after working with the program awhile, they became clear. As an example of **Crossword Magic**, I created this puzzle for ANTIC, around the seasonal theme of Christmas. Obviously, any theme can be developed.

The first option on the main menu asks for a choice of puzzle size. Grids of up to 20 by 20 squares are allowed. Typing a word and pressing [RETURN] will enter it in the puzzle grid. **Crossword Magic** will automatically interconnect and enter subsequent words. Any entry that does not fit immediately will be stored for later possible use. The latest entry is identified by flashing letters. This word can be relocated or deleted, but only while it remains the last entry. When all desired words are entered, clues can be written. There is no way to force a word to appear in a specific place. This would be a good option, as there were a few times a word would have fit nicely.

After completion, print the puzzle. Simply ready the printer, chose the proper selection, and push [START]. The puzzle grid, clues, and a complete version are printed. The printout is nicely done, but sometimes the lines are not precise.

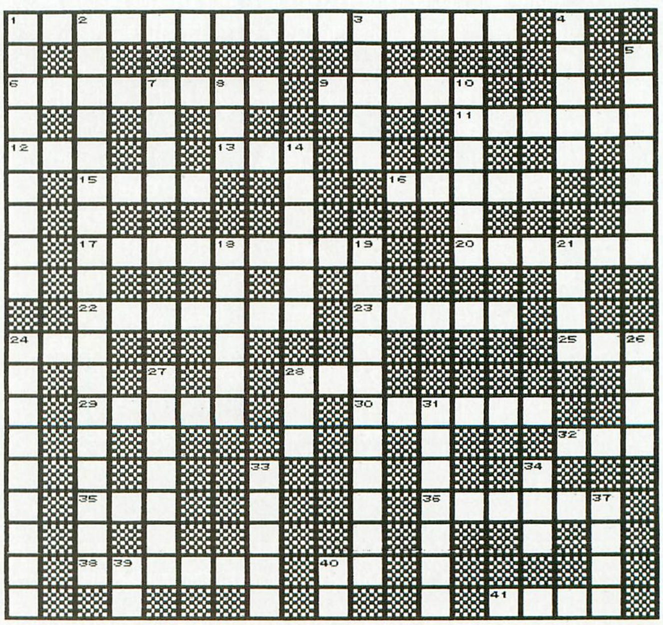
Solve the puzzle either on the computer, or on hard copy. Playing on the computer is somewhat awkward because the cursor doesn't necessarily go to the beginning of the next word, but it can be maneuvered using the space bar and the arrow keys. When you are finished, select the "answers" option to score and correct the puzzle.

DOWN CLUES

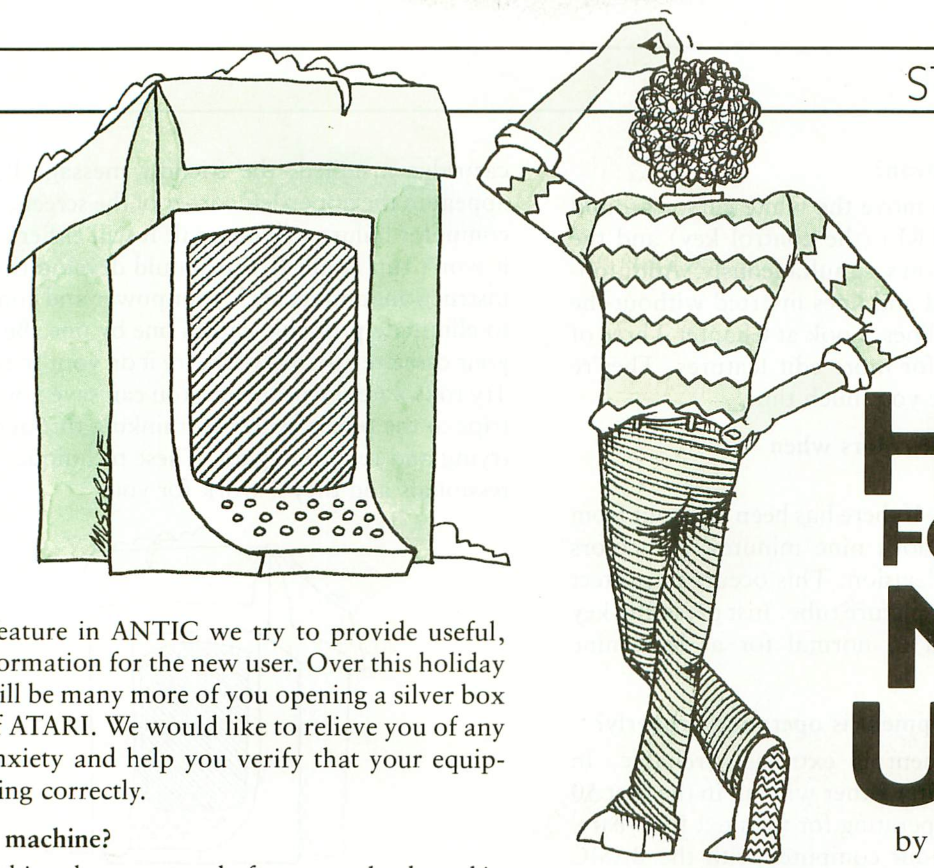
1. SANTA'S HOME (2 WORDS)
2. WHERE A MIRACLE OCCURRED (2 WORDS)
3. DELIVERS GIFTS
4. HOT CHOCOLATE
5. LEAVE MILK AND THESE FOR SANTA
7. WHAT A CHILD MIGHT PLAY WITH
8. HELPS SANTA CLAUS
10. PLACE TO PRAY
14. STOLE CHRISTMAS
18. NOT HARMONY
19. POPULAR ATARI GAME (2 WORDS)
21. BUY GIFTS
24. LITTLE TOWN, SUBJECT OF CHRISTMAS CAROL
26. WORD PROCESSOR EDITS THIS
27. STRING WITH CRANBERRIES
28. FELINE
31. ROPE-LIKE DECORATION
33. PLANT WITH RED BERRIES
34. DIMENSION
37. TRADITIONALLY USE A PINE
39. INPUT/OUTPUT
40. EXCLAMATION

ACROSS CLUES

1. CHRISTMAS BALLET (2 WORDS)
6. PULLS SANTA'S SLEIGH
9. THE ATARI RESOURCE
11. SANTA SAYS THIS
12. SPICY
13. PUDDING INGREDIENT (FRUIT)
15. CHRISTMAS EVE LOG
16. SEND GREETINGS WITH THESE
17. DECORATIONS
20. ALSO PULL SLEIGHS
22. RED-NOSED REINDEER
23. 400 AND 800 COMPANY
24. SMALLEST PIECE OF COMPUTER INFORMATION
25. COOKING UTENSIL
28. MODE OF TRANSPORTATION
29. WHITE
30. HALOS
32. PLACE (IN BASIC, USED WITH GET)
35. SELF CENTERED
36. COMMAND FOR PRINTER OUTPUT
38. SHIMMERING DECORATION
40. OPERATING SYSTEM
41. SMART



See page 102 for answers and product information.



HELP FOR THE NEW USER

by JAMES CAPPARELL

As a regular feature in ANTIC we try to provide useful, jargon-free information for the new user. Over this holiday season there will be many more of you opening a silver box to the world of ATARI. We would like to relieve you of any unnecessary anxiety and help you verify that your equipment is operating correctly.

Can I hurt my machine?

No, there is nothing that you can do from your keyboard in normal operation that will harm your ATARI. Feel free to press any key in any order. Experiment, try it, learn by example, and by trial and error. One note of warning, always save a copy of your program on cassette or disk prior to experimenting. This way you'll have a copy to reload should the experiment fail, or if someone kicks the plug out of the stocket. Keep food and drink away from your equipment, and disks and tapes away from magnetic fields.

What does 32K mean?

In computing circles terms like 16K or 32K are frequently heard. Numbers with the suffix K are used to refer to the amount of memory available in your machine. K is an engineering term and refers to the number 1000. So, 32K would mean that 32,000 characters of memory are available. Most ATARIs come factory equipped with 16K. Both the ATARI 400 and 800 can be expanded to 48K, or 48,000 characters of information. Consult your local dealer about memory expansion products.

How can I be sure that all my memory is there?

To verify that your installed memory is being recognized, type the command PRINT FRE(0), and press [RETURN].

With the BASIC caratridge installed you should read:

13326 (if 16K)
29710 (if 32K)
37902 (if 48K)

How many characters will fit on the screen?

A maximum of 40 text characters per line, by 24 lines, can be displayed on your TV screen. In normal operation only 38 characters are allowed. This can be changed by typing the command POKE 82,0 (press [RETURN]). This effectively moves the left margin two characters left, giving you the maximum of 40 characters. Press [SYSTEM RESET] to restore margins.

How long a line will BASIC accept?

BASIC can receive up to 120 characters per command line (three full 40-character lines). A warning buzzer sounds when 113 characters are typed. If you type more than the maximum, the excess characters are ignored.

Is there an easier or faster method of entering BASIC?

Yes, use abbreviations wherever possible (look at Appendix A of your BASIC Reference Manual). Using abbreviations will save typing time. For example use N. instead of NEXT or C. instead of COLOR. The BASIC cartridge will expand these abbreviations for you. It is also legal to eliminate spaces wherever possible, once again BASIC will insert spaces for you. For example, 110REM is okay.

What color should my screen be when I turn on my ATARI?

Your screen should be blue when first turned on. This is one of 128 color possibilities available. There are 16 colors and eight hues on very 400/800. Look at page 50 of the BASIC reference manual for the color-range description.

What is Memo Pad Mode?

The ATARI will respond with this statement whenever you turn power on without either a BASIC cartridge installed or the disk-system DOS installed. You can display characters on the screen, but that's about all.

continued on next page

What does screen editing mean?

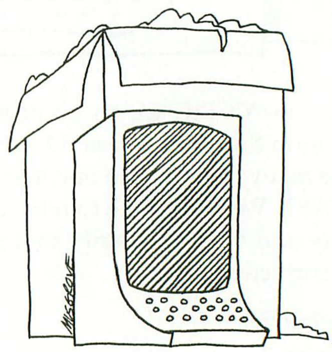
This refers to the ability to move the white cursor around the screen by pressing [CTRL] (the control key) and the up/down or left/right arrows simultaneously. Additionally, errors can be corrected and lines inserted without the necessity of retyping entire lines. Look at Chapter Three of BASIC Reference Manual for more edit features. They're very powerful and can save you much time.

Why does my screen change colors when I leave it for a while?

This is called Attract Mode. If there has been no input from your keyboard in the previous nine minutes, the colors begin to change on your television. This occurs to protect the color phosphors of your picture tube. Just press any key and the colors will return to normal for at least nine minutes more.

How can I be sure my equipment is operating properly?

Modern electronic equipment is extremely reliable. In almost all cases your computer either will fail in the first 50 hours of use, or continue operating for the next five years. Whenever you power-on your computer with the BASIC cartridge installed, the friendly message READY should appear in the upper-left corner of the screen. Almost always computer failure will be total. It will either run properly or it won't run at all. If you should develop trouble, read the instructions and recheck your power and connectors. Begin to eliminate probable causes one by one. Be methodical! If your cassette doesn't work, try it on your friend's computer. Try to isolate the problem. You can save yourself unneeded trips to the repair center by thinking through the problem, trying and retrying again. These techniques work for professionals and they'll work for you.



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Oh Holy Night

by W. E. PARKER

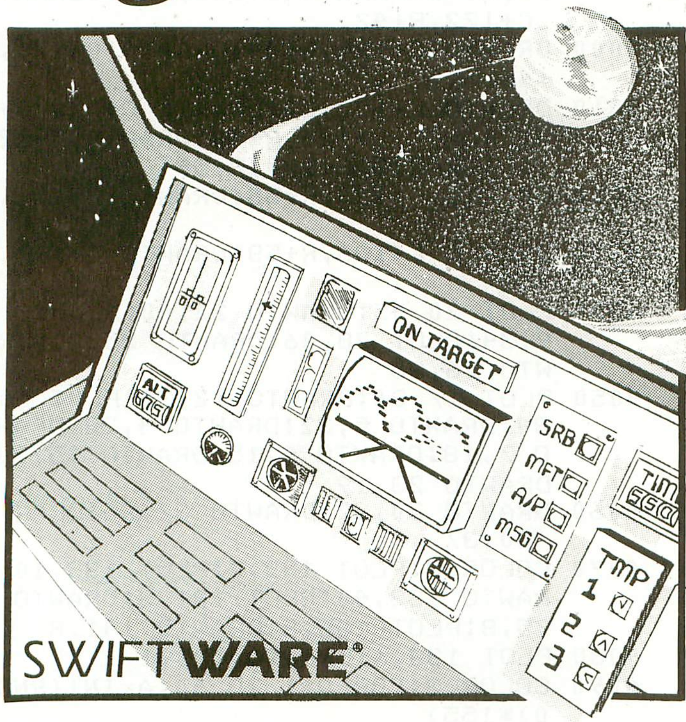


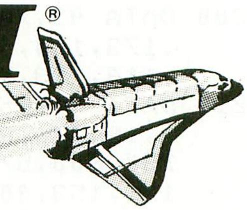
Here is a BASIC program that will display a pastoral scene while playing the Christmas hymn "Oh Holy Night." As the program begins, the scene is shown in daylight. Slowly the light fades and the stars appear, including the star of Bethlehem.

```
 30 REM SONG "OH HOLY NIGHT
    "
 40 BB=0.15
 50 BR=15
 60 L=6
 65 GOSUB 5000
 75 GOSUB 2270
 80 GOSUB 3000
 90 TRAP 400
100 READ T1,T2,T3,T4,D
110 RTN=RTN+1
200 GOSUB 1000
210 GOSUB 1090
230 BR=BR-BB
240 GOSUB 6000
300 GOTO 100
400 FOR D=1 TO 500:NEXT D:G
    OTO 400
500 SOUND 0,50,10,L:SOUND 2
    ,121,10,L:SOUND 3,173,1
    0,L:FOR DELAY=1 TO 300:
    NEXT DELAY:GOTO 1080
550 SOUND 1,68,10,L:SOUND 3
    ,173,10,L:FOR DELAY=1 T
    O 200:NEXT DELAY
560 SOUND 0,60,10,L:SOUND 1
    ,76,10,L:FOR DELAY=1 TO
     150:NEXT DELAY:GOTO 10
    80
570 SOUND 1,85,10,L:SOUND 2
    ,121,10,L:SOUND 3,37,P,
    L:FOR DELAY=1 TO 150:NE
    XT DELAY:GOTO 1080
580 SOUND 1,68,10,L:SOUND 3
    ,173,10,L:FOR DELAY=1 T
    O 200:NEXT DELAY:GOTO 1
    080
590 SOUND 2,102,10,L:FOR DE
    LAY=1 TO 200:NEXT DELAY
    :GOTO 1080
1000 P=10:IF T4<80 THEN P=12
1005 L=4:L1=2:IF D=601 THEN
     L=8:L1=6
1007 COLOR 3:PLOT 133,8
1010 SOUND 0,T1,10,L
1020 SOUND 1,T2,10,L
1030 SOUND 2,T3,10,L
1040 SOUND 3,T4,P,L1
1055 COLOR 0:PLOT 133,8
1060 FOR DELAY=1 TO D:NEXT D
     ELAY
1070 IF D=401 THEN 500
1072 IF D=402 THEN 550
1074 IF D=403 THEN 570
1076 IF D=404 THEN 580
1078 IF D=201 THEN 590
1080 RETURN
1090 FOR T=0 TO 3:SOUND T,0,
     0,0:NEXT T:RETURN
2000 DATA 91,114,153,230,200
     ,91,114,153,230,150,91,
     114,153,230,50,76,114,1
     28,230,500,76,114,128,1
     82,50
2010 DATA 68,114,128,173,150
     ,68,114,128,173,50,85,1
     14,128,173,150,68,68,12
     8,173,50,57,91,153,230,
     400
2020 DATA 76,91,114,230,100,
     76,114,182,230,50,91,11
     4,153,230,150,102,102,1
     73,230,50,114,114,182,4
     0,200
2030 DATA 91,118,153,40,150,
     85,118,153,40,50,76,121
     ,173,204,200,85,121,136
     ,40,150,102,121,173,40,
     50
2040 DATA 114,114,182,230,90
     0,91,114,153,230,200,91
     ,114,153,230,150,91,114
     ,153,230,50,76,114,114,
     182,350
2050 DATA 76,114,128,182,50,
     68,114,136,173,150,68,1
     14,136,173,50,85,114,13
     6,173,150,68,102,136,17
     3,50
2060 DATA 57,91,153,230,400,
     76,91,114,230,100,76,11
     4,182,230,50,81,128,182
     ,230,150,91,91,153,230,
     50
2070 DATA 60,91,153,243,200,
     76,91,121,243,150,68,96
     ,121,243,50,60,96,136,1
     62,200,57,96,136,162,15
     0
2080 DATA 60,96,136,243,50,9
     1,91,153,182,800,76,121
     ,153,182,100,76,121,173
     ,204,200,68,121,173,40,
     200
2090 DATA 102,102,153,243,20
     0,76,85,121,40,200,68,9
     1,114,230,150,76,91,114
     ,230,50,57,91,153,230,1
     50,91,91,153,40
2100 DATA 50,68,91,153,230,2
     00,76,91,114,230,150,76
     ,114,153,182,50,76,121,
     173,204,200,68,121,173,
     40,200
2120 DATA 102,102,153,243,20
     0,76,85,121,204,200,68,
     91,114,230,150,76,91,15
     3,230,50,57,91,153,40,1
     50,91,114,153,40
2140 DATA 50,76,114,182,230,
     400,57,91,114,136,601,6
     0,91,102,136,150,68,91,
     114,136,50,60,76,121,18
     2,600
2160 DATA 60,91,153,182,100,
     50,85,114,204,500,68,85
     ,102,204,50,68,85,102,2
     04,150
```

continued on page 28

Fly the SPACE SHUTTLE from your ATARI®





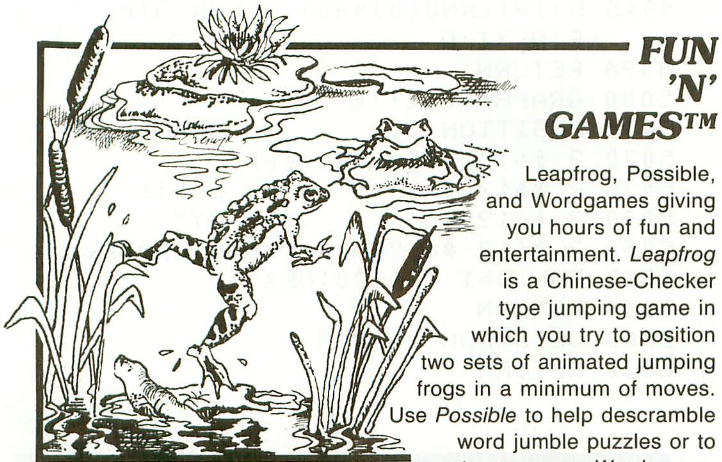
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By Paul Kindl

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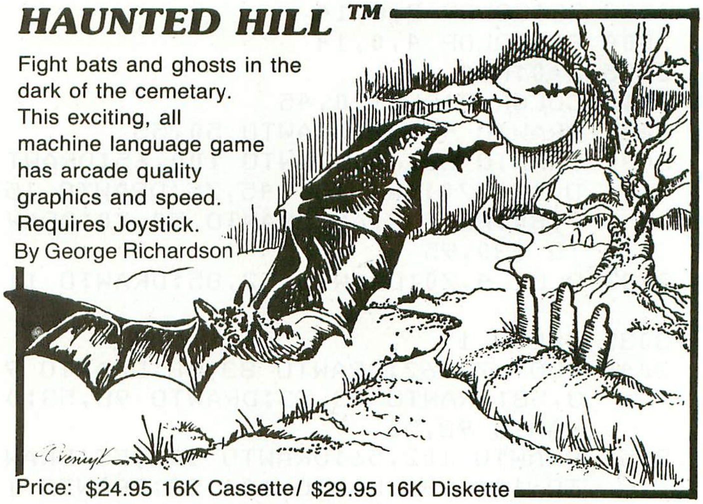
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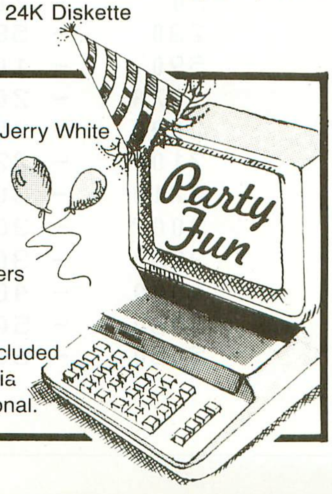
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VISA

```
2180 DATA 68,85,102,204,50,57,91,114,
     136,400,57,91,114,136,200,57,91,
     114,136,100
2200 DATA 45,76,114,153,401,76,76,121
     ,173,100,57,76,114,182,402,68,85
     ,114,173,50,76,91,114,153,403
2210 DATA 76,85,121,40,50,68,85,121,4
     0,150,76,85,121,40,50,76,91,114,
     230,600,57,76,114,182,200,50,76,
     121,153,400
2240 DATA 76,76,121,173,100,45,76,114
     ,182,404,50,68,114,173,201,57,76
     ,91,153,400,60,85,102,153,200
2260 DATA 57,85,114,153,150,50,85,121
     ,40,50,57,91,114,230,700
2270 GRAPHICS 2+16
2280 POSITION 3,0
2285 ? #6;"'O HolY NigHT'":? #6:? #6:
     ? #6;"     plays as day"
2286 ? #6:? #6;"   turns to night"
2287 FOR D=1 TO 1000:NEXT D
2290 RETURN
3000 GRAPHICS 7+16
3001 C=0:R=0
3002 SETCOLOR 1,12,14
3003 SETCOLOR 2,8,14
3004 SETCOLOR 4,0,14
3005 C=0:R=0
3010 COLOR 2:PLOT 0,45
3020 DRAWTO 40,47:DRAWTO 50,55
3030 DRAWTO 60,60:DRAWTO 100,65:DRAWT
     O 120,70:DRAWTO 145,75:DRAWTO 15
     9,80:PLOT 2,60:DRAWTO 50,70:DRAW
     TO 130,95
3032 PLOT 4,70:DRAWTO 52,85:DRAWTO 11
     0,95
3035 COLOR 1
3040 PLOT 73,62:DRAWTO 83,58:DRAWTO 9
     3,58:DRAWTO 93,53:DRAWTO 98,53:D
     RAWTO 98,56
3050 DRAWTO 102,56:DRAWTO 102,53:DRAW
     TO 106,53:DRAWTO 106,58:DRAWTO 1
     10,58:DRAWTO 110,53:DRAWTO 114,5
     3
3060 DRAWTO C+114,R+50:DRAWTO C+110,R
     +48:DRAWTO C+110,R+44:DRAWTO C+1
     14,R+42:DRAWTO C+118,R+38:DRAWTO
      C+122,R+42
3065 DRAWTO C+125,R+44:DRAWTO C+125,R
     +48
3070 DRAWTO C+122,50:DRAWTO C+122,R+5
     3:DRAWTO C+126,R+53:DRAWTO C+126
     ,58:DRAWTO C+130,R+58
3080 DRAWTO C+130,R+53:DRAWTO C+136,R
     +53
3085 C=22
3090 DRAWTO C+114,R+50:DRAWTO C+110,R
     +48:DRAWTO C+110,R+44:DRAWTO C+1
     14,R+42:DRAWTO C+118,R+38:DRAWTO
      C+122,R+42
4000 DRAWTO C+125,R+44:DRAWTO C+125,R
     +48
4010 DRAWTO C+122,50:DRAWTO C+122,R+5
     3:DRAWTO C+126,R+53:DRAWTO C+126
     ,58:DRAWTO C+130,R+58
4020 DRAWTO C+130,R+53:DRAWTO C+136,R
     +53
4030 DRAWTO C+136,R+58:DRAWTO C+137,R
     +58
4040 PLOT 20,45:DRAWTO 22,40:DRAWTO 1
     9,34:PLOT 28,46:DRAWTO 25,40:DRA
     WTO 26,35
4050 PLOT 17,36:DRAWTO 12,33:PLOT 10,
     34:DRAWTO 5,32:DRAWTO 4,28:DRAWT
     O 7,18:DRAWTO 9,15:DRAWTO 15,20:
     DRAWTO 23,19
4060 DRAWTO 30,22:DRAWTO 37,25:DRAWTO
      30,37
4070 COLOR 3:PLOT 133,8:PLOT 133,10:D
     RAWTO 133,40:PLOT 131,8:DRAWTO 1
     25,8:PLOT 135,8:DRAWTO 141,8
4080 PLOT 133,6:DRAWTO 133,1
4090 COLOR 3:FOR Q=1 TO 40:A=INT(RND(
     0)*155)
4095 B=INT(RND(0)*40):COLOR 3:PLOT A,
     B:NEXT Q
4096 RETURN
5000 GRAPHICS 1+16
5010 POSITION 3,3
5020 ? #6;"ChRIstMAs caRD"
5030 ? #6:? #6;"     IN muSIc"
5040 ? #6:? #6;"        BY"
5050 ? #6:? #6;" w.e.(gene) parker"
5080 FOR D=1 TO 600:NEXT D
5090 RETURN
6000 SETCOLOR 4,0,BR
6030 RETURN
```

TYPO TABLE

Variable checksum = 263861

Line num range	Code	Length
30 - 210	PT	181
230 - 580	PK	579
590 - 1072	VP	390
1074 - 2030	OO	520
2040 - 2090	AX	590
2100 - 2200	NX	552
2210 - 3001	WW	510
3002 - 3040	BD	512
3050 - 3090	IT	617
4000 - 4050	QF	526
4060 - 5040	DH	503
5050 - 6030	FD	108

JOYSTICK SURVEY



Alternatives to the Atari controller

by DAVE PLOTKIN

Probably more Atari joysticks have been sold than any other kind. Atari joysticks are relatively cheap, provide good control, and can be held quite easily by small hands. They can be purchased almost anywhere and will stand up to some abuse, like being stepped on, or dropped. But the limitations of the Atari joysticks have led to a search by game *aficionados* for a better joystick. For one thing, Atari joysticks break with distressing regularity. Also, its stiff "spring" requires a lot of force to manipulate. Even people with strong hands tire after hours of play. Both these problems stem from the joystick's internal plastic ring which must be forcibly bent against a series of switches.

An inexpensive solution to some of the problems of the Atari joystick is called the "Grabber". Nothing more than a plastic top about the size of a golf ball, the Grabber slips over the head of the Atari joystick, making the stick easier to grasp and somewhat less wearing on the user's hand.

Until recently, no really satisfactory substitute for the Atari joystick has been available. The first alternative was "Le Stick" from DataSoft. Billed as a one-handed joystick, it has internal mercury switches which detect the angle at which it is being held. The "fire" button is mounted on top. Some people like Le Stick, but most find that it is very hard to keep the stick perfectly upright, a position often needed to keep the cursor from moving. A squeeze-trigger in Le Stick is supposed to freeze the cursor, but my hand gets tired and it is hard to adjust to the joystick action. Also, the uncertainty of directional response makes this stick unsuitable for very fast action games.

Next was a rejuvenation of the old Fairchild "Channel F" joystick, entitled the "Video Command," and produced by Zircon. It has many of the features I look for, including a large, comfortable hand grip and positive control requiring very little force. The control element itself is a bulging triangular shape that nestles in the palm of one hand. At $15, or about $5 more than the Atari joystick, it looked very good. Unfortunately, the firing is accomplished by pushing down on the triangular element. Not only does this tend to cause the cursor to jump away from the aiming point, but the firing sequence wasn't always detected from every angle. *[A new version of Video Command has a firing trigger, but appeared too late for testing.—ANTIC ED]*

The New Sticks

In the past few months, the sad lack of good Atari-compatible joysticks has changed for the better. At least four new joysticks have been marketed, ranging in price from about $20 to $40. Also available now is an alternative known as a trac-ball.

These new joysticks have one feature in common, which makes them all superior to the Atari joystick. Rather than using membrane microswitches and a deformable plastic ring, they use a tried-and-true mechanical type switch known as a "leaf switch". A leaf switch consists of a pair of thin pieces of metal (usually spring steel) held apart at one end by a 1/8″ spacer. Four of these switches are mounted at the four compass points around the bottom of the joystick handle inside the joystick's base. The action of the joystick presses the metal slivers together, causing a contact.

The advantages of this design are considerable. The springiness of the leaf switch causes auto-centering of the joystick. The absence of parts which can fatigue and break should provide for a long-lived joystick. (Compare the usual one-year warranty on these sticks with the ninety-days on the Atari.) Additionally, only a very light pressure is required to operate these sticks — fatigue of the joystick hand becomes a thing of the past.

In this evaluation of the four new joysticks, the following points have been considered:

1. Ease of manipulation — how much force is required on the stick itself, and how easy it is to grasp the stick comfortably?

Dave Plotkin is an industrial engineer and inveterate game player/designer. His "Attack on the Death STar" appeared in ANTIC #2.

continued on next page

2. Firing button — where is the button, how much force is required to operate it, how far must it be pushed to make contact? While the "usual" position of the firing button is at the upper left corner of the *base* of the joystick, some sticks are now offering a fire button located on top of the stick, which frees one hand. One stick even offers the choice of locating the firing button on the upper *right* corner of the base, ideal for left-handers.
3. The design of the base — do you use the joystick by placing it on a table, or hold the base in one hand and play with the other? A larger base makes the joystick steadier on a table, but more difficult to hold in the hand.
4. Direction sensitivity — how well does the stick differentiate among the various directions, both diagonal and non-diagonal?

All of the joysticks were tested by several adults and children.

The "Pointmaster Competition Joystick" is manufactured by Discwasher Corporation and is the least expensive of all the joysticks tested. This joystick offers a firing button only at the top of the stick. The firing button is large and exceptionally easy to use, as it has a very short "throw" (the distance you have to push the button to activate it). The button also has a definite click to it, so you know you have pushed it. Top-of-stick fire buttons are advantageous for games such as "Star Raiders", where keyboard input is required, and perfectly adequate for games such as "Space Invaders", which don't require complex stick movements. But games which require fast, independent movement of the stick and fire button, such as Synapse Software's "Shamus", don't play well on this joystick.

Pointmaster's handgrip is molded and very comfortable for both large and small hands. It looks like an aircraft control stick and conveys a feeling of actually flying the spaceship in "Star Raiders". This stick generally moves smoothly and easily. The base is about the size of the Atari joystick and is easily handled. A somewhat larger base would have provided more stability for one-handed table top use. Direction sensitivity is about the same as the Atari joystick.

The Newport "Prostick", by Newport Machine Design, is only available by mail order. It is an intermediate-priced joystick (see Table), with a base about the same size as the Atari joystick, but somewhat thicker, making it a little harder to hand-hold. The stick itself is a little shorter than the Atari and has a one-inch diameter ball mounted at the top. This configuration makes it a bit difficult for adults to get a good grip on the joystick — the ball is too small to nestle comfortably in the hand, and the stick is a little short to wrap a large hand around. Nonetheless, it is possible to adjust to this stick. It provides excellent response and is the most compact of the sticks tested. Kids have no trouble grasping this stick. The firing button is in the traditional position. The firing button on this stick is the stiffest (requires the most force), and had the longest "throw" of all the

TABLE 1

STICK	MANUFACTURER	PRICE	HANDLING	FIRE BUTTON
Atari	Atari, Inc.	$11.95	Hand/Table	Base Left
Big Stick	Baylis—T.E.S.	39.95	Table	Base Left or Right
Command Control	Wico	29.95	Hand/Table	Base Left & Stick
Le Stick	DataSoft	39.95	Hand	Stick
Pointmaster	Discwasher	19.95	Hand/Table	Stick
Prostick	Newport	29.95	Hand/Table	Base Left
Tracball	Wico	69.95	Table	Base Left
Video Command	Zircon	16.95	Hand	Stick

sticks tested. This stick, would probably be better with a different button. The direction sensitivity on this stick was about the best of all the sticks — it generally detected the diagonal successfully without giving a diagonal for up / down / left / right.

The "Command Control" joystick from Wico Corporation was the overall favorite of the people who participated in this review. Wico is the largest manufacturer of arcade joysticks, and they know their business. The Command Control had the smoothest joystick response overall, with very little force required to operate. The base is a bit larger than the Atari joystick, making the Wico very steady in table-top operation, although hard to handhold. The stick is shaped like a miniature baseball bat, and children and adults alike had no trouble grasping it. This stick is unique in that it has buttons both in the traditional base position and on top of the joystick. A switch on the base selects which button to use. Both buttons are easy to work, although you can occasionally miss a shot because you forgot which way the switch is set. The direction sensitivity was better than the Atari joystick, but not quite as good as the Newport.

The largest and most expensive joystick tested is the "Big Stick" from R. Allen Baylis Company. The base is absolutely huge, measuring eight inches on a side and three and a half inches thick. Definitely not for handholding, it can be placed on a table or in your lap. The stick is quite short, with an arcade-size ball mounted at the top for a fairly comfortable grip. The Big Stick, is, in fact, a Wico arcade stick mounted in a box. Therefore, it has the most "arcade" feel of all the sticks tested. The stick is ultrasensitive — slight pressure in any direction triggers a response. In fact, many find it *too* sensitive — diagonals are often detected when not wanted. However, a very light touch seems to produce acceptable results. The fire button works well. It is mounted close enough to the edge that the thumb can rest comfortably on it with the fingers over the side. The fire button can be ordered on either side, so left-handers can get a left-handed stick.

Some arcade games such as "Centipede" and "Missile Command" can't use a joystick. Instead, a tracball is used. A tracball is a device housing a ball which can be spun in all directions a joystick can be pushed. As long as the ball is spinning in a given direction, the screen image controlled by the ball will move in that direction. Wico Corporation has introduced a tracball. The tracball will control *any* program which can use a joystick, and seems to work as well as the arcade tracballs with the likes of "Missile Command". Of course, when moving the tracball in a given direction, it is hard not to get some component of another direction in the movement. In Atari's "Asteroids", for example, the left / right spin which rotates the space ship usually moves it forward a little bit too, but then, why play "Asteroids" with a tracball?

The pertinent information for the tested joysticks is listed in Table 1. The inexpensive Pointmaster did a very creditable job for games where the single fire button on the stick was not a problem. The Wico Command Control was the overall favorite, and the Big Stick had the most "arcade" feel.

The Prostick may be purchased from:

G.A.M.E.S Inc.
6626 Valjean Avenue
Van Nuys, CA 91406

for $29.95, plus $2.00 (U.P.S.). For more information, you may call (213) 781-1300. G.A.M.E.S.' ORDER ONLY phone for VISA / MasterCard orders is (800) 626-9592, Mondays through Saturdays, 9 a.m. to 5 p.m.

The Big Stick may be purchased from:

Torrey Engberg Smith Co.
P.O. Box 1075
Glendale, CA 91206

Send a check or money order only.



WORD'S WORTH

by GEORGE FIREDRAKE and BOB ALBRECHT

DragonSmoke poses problems for you to ponder, questions for you to answer, programs for you to write, and whatever other mischief we might cunningly contrive. As time goes on, and as issue follows issue, we will solve some of the problems we create. Better yet, *you* will solve them.

ASCII LAND

Deep down inside the computer, each keyboard character has its very own numeric code, called an ASCII code. ASCII means *A*merican *S*tandard *C*ode for *I*nformation *I*nterchange. This is only the beginning of life for a keyboard character. Of course, every character wants to be part of TRON.

- The ASCII code for A is 65.
- The ASCII code for B is 66.
- The ASCII code for C is 67.
- Guess. What is the ASCII code for D?
- Guess. What is the ASCII code for Z?

The ASCII codes for upper case letters A to Z are the numbers 65 to 90.

Atari BASIC provides a built-in function, called ASC, which gives the ASCII code for any character. Clear the screen and try these.

You type: PRINT ASC("A")
It prints: 65

The letter A, enclosed in quotation marks

You type: PRINT ASC("B")
It prints: 66

You type: PRINT ASC("Z")
It prints: 90

Bob Albrecht is the author of the book Atari BASIC, that accompanies the BASIC catridge. He has been involved in computer writing and education for 20 years, and is a co-owner of Dymax, a publishing company in Menlo Park, CA. George Firedrake is a dragon.

REMEMBER: If a character is an upper case letter, A to Z, its ASCII code is a number, 65 to 90. A character whose ASCII code is less than 65 or more than 90 is *not* an upper case letter A to Z. You might use this fact in a program we suggest near the end of this article.

WORD'S WORTH #1

Assign a number to each letter of the alphabet, A to Z, as follows.

A = 1	B = 2	C = 3	D = 4	E = 5	F = 6
G = 7	H = 8	I = 9	J = 10	K = 11	L = 12
M = 13	N = 14	O = 15	P = 16	Q = 17	R = 18
S = 19	T = 20	U = 21	V = 23	W = 23	X = 24
Y = 25	Z = 26				

We call these *letter scores* (LS). The letter score of A is 1; the letter score (LS) of B is 2; the letter score (LS) of C is 3; and so on — the letter score of Z is 26. A *Word's Worth* (WW) is obtained by adding the letter scores of the letters in a word. For example, HOBBIT is worth 56, DRAGON is worth 59, and WIZARD is worth 81. The Word's Worth (WW) is the sum of the Letter Scores (LS).

Now we will ask you some questions. To answer these questions, you must find a word in a dictionary. There are many dictionaries, so let's all use the same one. The abridged *American Heritage Dictionary* has 55,000 words, and you can buy a copy for $3.95 at most any bookstore.

You people with ten-pound dictionaries may also respond, but please tell us which dictionary you used, including its most recent copyright date. If you come up with an interesting answer, we might mention it in a future issue.

Okay, with dictionary in hand, try one or more of these questions.

1. How many three-letter words have a Word's Worth less than 100?
2. What three-letter word has the smallest Word's Worth?
3. What three-letter word has the largest Word's Worth?

4. In the dictionary we selected, what word has the largest Word's Worth?
5. What is the most *interesting* three letter word? By "interesting," we mean what word, together with its Word's Worth, is most interesting?
6. What words have a WW of 12?
7. What words have a WW of 123? And so on.
8. In our chosen dictionary, send us words whose Word's Worths are prime numbers less than 100. For each prime number, send us a word.

   EXTRA CHALLENGE: As much as possible, let each word be related in some way to the prime number.
9. Send us "odd" words whose Word's Worth is an odd number and "even" words whose Word's Worth is even.
10. Add to your fun (and ours) by sending in new Word's Worth ideas.

Word's Worth is an example of a class of questions and problems in which your ATARI can do the work, while *you* do the thinking. *You* can write a program to compute the Word's Worth of any word, or string of letters, that you type in.

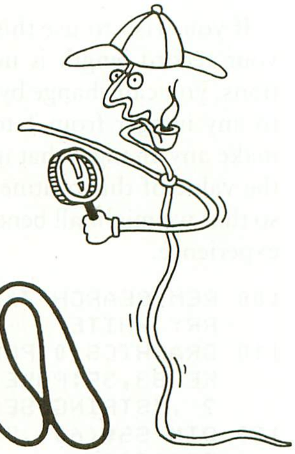
We challenge you to write a program to compute answers for this month's Word's Worth questions. We want *you* to write a program to:

- Accept a "word" (any string).
- Compute Word's Worth #1 using all the *letters* in the string. *Throw away* anything not a letter.
- Print the Word's Worth #1 of the string of letters.

Next time, we will show you our Word's Worth #1 program. We will also tell you about Word's Worth #2. In the meantime, if you want to reach us, write to: George and Bob, P.O. Box 310, Menlo Park, CA 94025. If you want a reply, enclose a self-addressed, stamped envelope (SASE).

String Search

by JERRY WHITE



While developing commercial software I've often wished I could make a faster string search in an ATARI BASIC program. In one case, I had to search through a long string of eight character records, for one specific record. The ATARI BASIC routine I wrote was much too slow. If I used BASIC A+, the FIND command would do the trick, but I needed to use ATARI BASIC. The only alternative was to write an Assembler subroutine to do the job.

As you can see, I put lots of comments in the Assembler Source Code for my fellow Assembler hackers. The Assembler routine is included in my BASIC demo program, so you won't need an Assembler Cartridge. Type in the little BASIC program now, but SAVE IT BEFORE YOU RUN IT!

The BASIC program begins by setting Graphics Mode 0, the margins at their default values, and the print tab width at 8.

In line 120, we dimension three strings. SS$ will be used to store our machine language routine. DSTR$ is our Data STRing which will store the data we wish to search FOR. SSTR$ is our Search STRing which is dimensioned to 8,000 characters. Think of it as 1,000 eight-character words, with each word representing one record. The idea is to find one specific word. That word is the one stored in DSTR$.

My search routine is stored in DATA statements. At line 200, we read the data and put it into the string SS$. At line 210, we store 8,000 spaces in SSTR$, we put the word "FINDTHIS" into DSTR$, and set COUNT equal to 1,000. COUNT is our total number of records. At this time, SSTR$ contains 1,000 (COUNT) records.

At line 240, we ask the user to enter a number from 1 to 1000, and store it as RN (Record Number). Line 250 puts DSTR$ or "FINDTHIS" into SSTR$ as the record number specified by the user. For our initial test, enter the number 1000 and press RETURN. !We are looking for a numeric value, so DO NOT enter 1,000. No comma please!

Press the START key to execute the string search. The program will search through 999 records before it finds "FINDTHIS". It will then tell you that "DSTR$ MATCHES RECORD 1000 in SSTR$, and END with the message BASIC IS READY. If you don't see this message, go back and check your typing and make sure you followed directions.

If all went well, you saw these messages almost immediately after you pressed the START key. That's the advantage of assembly language, speed!

Now let's change things so that the search is unsuccessful. But first, make sure you have saved the program. Then change line 250 to SSTR$ (RN*8-7,RN*8) = "FINDTHAT". The search will look for "FINDTHIS". When we reach line 310, FIND will be equal to zero and we will have proved that the routine works.

Look at line 300. This is where we call the machine language subroutine. We must pass along the address of our Assembler program, the COUNT (number of records to search through), the address of the string to be searched, and the address of the string to search for. Be sure to enter this data properly, and in this specific order. The Assembler program does no error checking.

Now let's make a comparison between this routine, and a similar routine in BASIC. Before we do this, change line 250 back to SSTR$ (RN*8-7,RN*8) = DSTR$. Change line 330 to STOP. Now RUN this program again and be sure to specify record number 1000. If all went well, you now see the message "STOPPED AT LINE 330" near the bottom of your screen.

Since the program did not END, our strings are still usable. To demonstrate the same search in BASIC, we will add 2 lines to our program. Add these lines:

```
1 FOR RN = 1 TO 1000:REC =
  RN*8:IF DSTR$ = SSTR$(REC-7,
  REC) THEN ?RN:STOP
2 NEXT RN:STOP
```

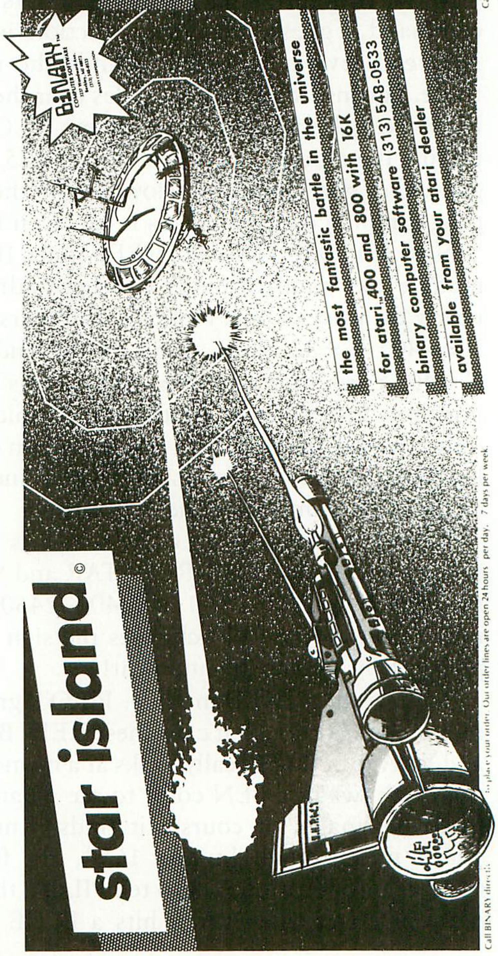
To execute this routine, type GOTO 1 and press RETURN. BASIC will find our match in approximately 17 seconds.

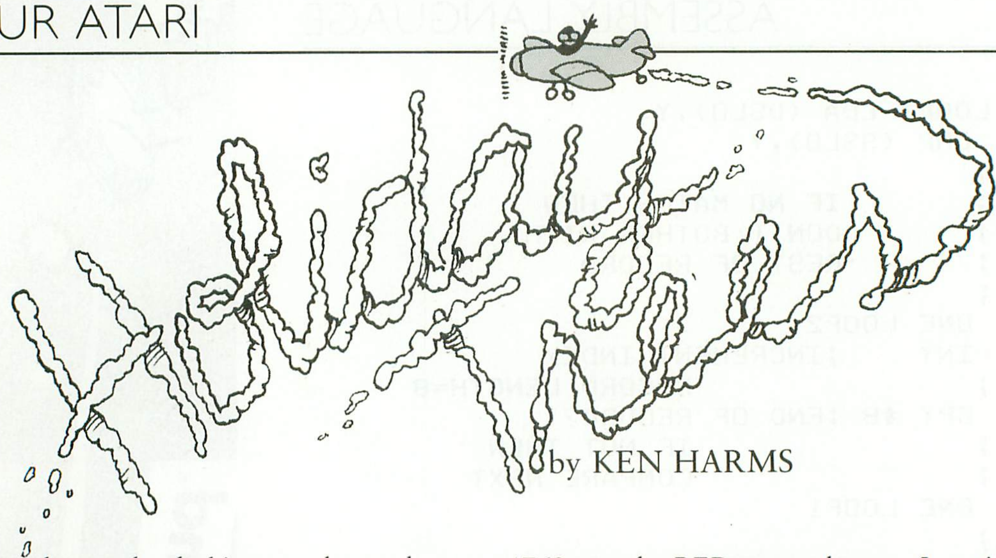
If you wish to use this routine, but your record length is not eight positions, you can change bytes 30 and 38 to any integer from 1 to 255. If you make any changes that might increase the value of this routine, let us know so that we might all benefit from your experience.

```
100 REM SEARCH 7/2/82 BY JERRY WHITE
110 GRAPHICS 0:POKE 82,2:POKE 83,39:POKE 201,8:? :? ,"STRING SEARCH DEMO"
120 DIM SS$(60),DSTR$(8),SSTR$(8000)
130 ? :? "CREATING MACHINE LANGUAGE STRING SS$"
140 DATA 104,104,133,213,104,133,212,104,133,206
150 DATA 104,133,205,104,133,204,104,133,203,160
160 DATA 0,177,203,209,205,208,6,200,192,8
170 DATA 208,245,96,165,205,24,105,8,133,205
180 DATA 144,2,230,206,165,212,208,6,165,213
190 DATA 240,7,198,213,198,212,24,144,216,96
200 FOR ML=1 TO 60:READ IT:SS$(ML,ML)=CHR$(IT):SOUND 0,IT,10,8:NEXT ML:SOUND 0,0,0,0
210 SSTR$=" ":SSTR$(8000)=" ":SSTR$(2)=SSTR$:DSTR$="FINDTHIS":COUNT=1000
220 ? :? "SSTR$=1000 BLANK 8 CHARACTER RECORDS"
230 ? :? "DSTR$=";CHR$(34);"FINDTHIS";CHR$(34)
240 ? :? "ENTER RECORD # FROM 1-1000";:TRAP 240:INPUT RN:IF RN<1 OR RN>COUNT THEN 240
250 SSTR$(RN*8-7,RN*8)=DSTR$
260 ? :? CHR$(34);"FINDTHIS";CHR$(34);" HAS BEEN PUT INTO SSTR$"
270 ? :? "AS RECORD NUMBER ";RN
280 ? :? "PRESS START TO EXECUTE STRING SEARCH";
290 IF PEEK(53279)<>6 THEN 290
300 FIND=USR(ADR(SS$),COUNT,ADR(SSTR$),ADR(DSTR$))
310 IF FIND=0 THEN ? :? :? "DSTR$ NOT FOUND IN SSTR$":GOTO 330
320 ? :? :? "DSTR$ MATCHES RECORD ";COUNT-FIND+1;" IN SSTR$"
330 ? :? "BASIC":? "IS";:END
```

```
10 ;STRING SEARCH SUBROUTINE
20 ;BY JERRY WHITE 7/2/82
30 ;
40 ;CALL FROM BASIC (SS$)
50 ;FIND=USR(ADR(SS$),COUNT,ADR(DSTR$),ADR(SSTR$))
60 ;
70 ;"FINDTHIS" SETUP FOR
80 ;8 CHARACTER RECORDS
90 ;
0100        *=$600         ;RELOCATABLE
0110 SSLO=$CD              ;SSTR$ LO BYTE
0120 SSHI=$CE              ;SSTR$ HI BYTE
0130 DSLO=$CB              ;DSTR$ LO BYTE
0140 DSHI=$CC              ;DSTR$ HI BYTE
0150 COUNTL=$D4             ;COUNT LO BYTE
0160 COUNTH=$D5             ;COUNT HI BYTE
0170 ;
0180  PLA
0190  PLA
0200  STA COUNTH           ;STORE
0210  PLA
0220  STA COUNTL           ;ARGUMENTS
0230  PLA
0240  STA SSHI             ;ON
0250  PLA
0260  STA SSLO             ;PAGE 0
0270  PLA
0280  STA DSHI
0290  PLA
0300  STA DSLO
0310 BEGIN LDY #0          ;INDEX=Y
0320 ;
0330 ;
0340 ;     COMPARE ONE BYTE
0350 ;     FROM DATA STRING
0360 ;     WITH ONE BYTE
0370 ;     FROM SEARCH STRING
```

```
0380 LOOP1 LDA (DSLO),Y
0390  CMP (SSLO),Y
0400 ;
0410 ;       IF NO MATCH THEN
0420 ;       DON'T BOTHER WITH
0430 ;       REST OF RECORD
0440 ;
0450  BNE LOOP2
0460  INY    ;INCREMENT INDEX
0470 ;               RECORD LENGTH=8
0480  CPY #8 ;END OF RECORD?
0490 ;               IF NOT THEN
0500 ;               COMPARE NEXT
0510  BNE LOOP1
0520 ;
0530 ;       WE FOUND A MATCH
0540 ;       SO RETURN TO BASIC
0550  RTS
0560 ;
0570 ;       RESET SEARCH ADDRESS
0580 ;       TO NEXT RECORD
0590 ;
0600 LOOP2 LDA SSLO
0610  CLC
0620  ADC #8 ;8 CHARACTER RECORD
0630  STA SSLO
0640  BCC LOOP3
0650 ;
0660 ;       CARRY SET SO
0670 ;       INCREMENT HI BYTE
0680 ;
0690  INC SSHI
0700 LOOP3 LDA COUNTL
0710 ;
0720 ;       IF LO BYTE<>0
0730 ;       DON'T CHECK HI BYTE
0740 ;
0750  BNE LOOP4
0760  LDA COUNTH
0770 ;
0780 ;       COUNTER=0 SO
0790 ;       RETURN TO BASIC
0800 ;
0810  BEQ EXIT
0820 ;
0830 ;       DECREMENT COUNTERS
0840 ;
0850  DEC COUNTH
0860 LOOP4 DEC COUNTL
0870  CLC     ;FORCE BRANCH
0880  BCC BEGIN
0890 ;
0900 ;       IF WE GOT HERE THEN
0910 ;       THE SEARCH WAS NEGATIVE
0920 EXIT RTS
```



by KEN HARMS

Add to your holiday pleasure by decking out these cybernetic trees using this PILOT program. It comes complete with colored lights, a scrolling message, and Jingle Bells in one-part harmony. To do this we will use some innovative techniques that will expand your understanding of PILOT programming.

Let's wander through the listing. After the title lines, we find a J:ump command at line 50. As you'll see, we U:se *PARSE, *COLORS, and *LLOOP over and over as the program operates. Each time PILOT hits a U:se or J:ump command, it goes to the first instruction (in this case, line 1) and reads every line until it finds the required module name. Putting often-used modules near the front of the listing makes the program run faster. PILOT is fast. Even putting the modules at the end of the 225 lines of this program did not noticeably slow down the song, but this programming concept makes it run even faster.

Now J:ump to *DRAWTREES (lines 1000–1540). This module uses a mirror-image concept to draw two trees for nearly the price of one. Notice that the first tree is drawn at X=-40, Y=32 (lines 1050–1070) and the second at X=40, Y=32 (lines 1080 & 1090). This means that the Y positions in both trees are the same while the X positions differ by only the sign. As a result, we can draw in the same location in both trees by using positive and negative values of the same number for the X position.

We use this concept to draw the stars and balls with a single position and *MIRRORSTAR and *MIRRORBALL modules (lines 2100–2160 and 2400–2460). The C:ompute instruction in line 2140 changes the sign of #X by multiplying it by -1. Simple and neat!

Back to the *TREE module. PILOT graphics uses only four colors. Although it calls these RED, BLUE, YELLOW and ERASE, PILOT really looks at a memory location each time it draws in a PEN color to see what color should be used. Normally, of course, it finds a number in BLUE which means blue. In line 1650, we force a different number into location 708 to tell PILOT that we want it to draw in green whenever it hits a BLUE command. Line 1760 sets the RED pen to brown. Location 709 controls YELLOW and 711 the ERASE commands. You might want to experiment (or refer to ANTIC #3 or Atari's BASIC Manual) to see how these "registers" work.

After we finish drawing and decorating the trees, we end up at line 1530, which C:omputes a string into the $MESSAGE variable. I had to double space the message because the A:ccept command, used later in the *PARSE module, automatically inserts blanks at the start and end of each string. At present, there doesn't seem to be a good way around this restriction, but we end up with a nice message anyway. Although the printer doesn't show it, an ESCAPE character is placed between each word to preserve word spacing. This is necessary because A:ccept also condenses all multiple spaces to single spaces. The ESCAPE character will not print the message: you enter it by pressing the ESCAPE key twice.

You'll probably want to enter your own message. Just type [space] [ESC] [space] between each word and two ESC's at the end. Also, keep the message less than 255 letters long.

When finished drawing the trees, we J:ump to *MAINLOOP (lines 600–699). This module is the workhorse, it plays the song, calls for the message and color changes. It's rather long but really simple to type in. All the *LLOOP commands are on multiples of three — just type it once and use Atari's wonderful screen editor to change the line number. Ditto for the SO:ound and PA:use commands.

*MAINLINE does one other important thing. Since the program doesn't use any keystrokes, the ATARI would soon begin changing screen colors. The C:ompute in line 688 puts a 0 in location 77 to tell the computer that a key has been pressed even when none was. This delays the "attract" mode each time through the loop.

The next module, *LLOOP, simply calls *PARSE and *COLORS. Last issue covered breaking ("parsing") strings into individual characters. That's what the *PARSE module does. As you type it, remember the two right arrows in line 150 and 37 in line 180. The arrows tell the

MS: command to skip a character for each arrow before looking for a M:atch.

After skipping 37 characters in line 180, the MS:$RIGHT in line 190 forces the first 37 letters into the $LEFT string which we T:ype in line 210. That's the billboard section of the message. By repeatedly stripping off the first character and adding it to the end of the message, we make the words march across the text window at the bottom of the graphic screen. Oh yes, C:@B656? That's a memory location which tells PILOT to T:ype the message on the second line of the text window. Without that, each message would T:ype on a different line and would scroll off the top. (Just for fun, the lines are numbered 0 through 3.)

Although *PARSE is busy, *COLORS (lines 300–400) is a speedy devil too. By C:omputing different values for location 709, *COLORS changes the color in the YELLOW pen. This flashes red, blue, brown, and yellow in the stars and balls.

To close, let me answer two questions. How do I get PILOT to number the modules in different series? Simple. As I build a program, each module is stored in a different disk file. After all modules are debugged, each is LOADed into memory and RENumbered in a number series which doesn't overlap with any other module. It's then SAVEd, memory NEWed and the next module loaded. After all are RENumbered, all are LOADed into a complete program and SAVEd in a different file.

Last, how do I get those big letters in the R:emarks? Just enter a control N (a bar symbol) right after the colon.

Best wishes for a happy holiday season watching your cybernetic trees!

```
1 R:
10 R:CHRISTMAS TREES
20 R:
30 R:      ANTIC, VOLUME 1, NO. 5
40 R:
50 J:*DRAWTREES
100 R:
110 R:          PARSE
120 R:
130 *PARSE
140 A:=$MESSAGE
150 MS:,
155 R: LINE 150 IS 2 RIGHT ARROWS A
ND COMMA
160 MS:$RIGHT
170 A:$MESSAGE=$MATCH$LEFT
180 MS:,
185 R: LINE 180 IS 37 RIGHT ARROWS
AND COMMA
190 MS:$RIGHT
200 C:@B656=1
210 T:$LEFT
220 E:
300 R:
310 R:          COLORS
320 R:
330 *COLORS
340 C:#B=#B+1
350 C(#B=1):@B709=146
360 C(#B=2):@B709=66
370 C(#B=3):@B709=26
380 C(#B=4):@B709=18
390 C(#B=4):#B=0
400 E:
500 R:
510 R:          LLOOP
520 R:
530 *LLOOP
540 U:*COLORS
550 U:*PARSE
560 SO:0
570 E:
600 R:
601 R:          MAINLOOP
602 R:
603 *MAINLOOP
604 U:*PARSE
605 R: 1ST PARSE TO GET TEXT
606 R: NOTE NUMBER SEQUENCE
607 SO:22
608 PA:16
609 U:*LLOOP
610 SO:22
611 PA:16
612 U:*LLOOP
613 SO:22
614 PA:32
615 U:*LLOOP
616 SO:22
617 PA:16
618 U:*LLOOP
619 SO:22
620 PA:16
621 U:*LLOOP
622 SO:22
623 PA:32
624 U:*LLOOP
625 SO:22
626 PA:16
627 U:*LLOOP
628 SO:25
629 PA:16
630 U:*LLOOP
631 SO:18
632 PA:24
633 U:*LLOOP
634 SO:20
635 PA:8
636 U:*LLOOP
637 SO:22
638 PA:48
639 U:*LLOOP
640 SO:0
641 PA:16
642 U:*LLOOP
643 SO:23
644 PA:16
645 U:*LLOOP
646 SO:23
647 PA:16
648 U:*LLOOP
649 SO:23
650 PA:24
651 U:*LLOOP
652 SO:23
653 PA:8
654 U:*LLOOP
655 SO:23
656 PA:16
657 U:*LLOOP
658 SO:22
659 PA:16
660 U:*LLOOP
661 SO:22
662 PA:16
663 U:*LLOOP
664 SO:22
665 PA:8
666 U:*LLOOP
667 SO:22
668 PA:8
669 U:*LLOOP
670 SO:25
671 PA:16
672 U:*LLOOP
673 SO:25
674 PA:16
675 U:*LLOOP
676 SO:23
677 PA:16
678 U:*LLOOP
679 SO:20
680 PA:16
681 U:*LLOOP
682 SO:18
683 PA:48
684 U:*LLOOP
685 SO:0
686 SO:0
687 PA:64
688 C:@B77=0
689 J:*MAINLOOP
1000 R:
1010 R:          DRAWTREES
1020 R:
1030 *DRAWTREES
1040 GR:CLEAR
1050 C:#X=-40
1060 C:#Y=-28
1070 U:*TREE
1080 C:#X=40
1090 U:*TREE
1100 R: NOW PUT SOME STARS ON THEM
1110 C:#X=-40
1120 C:#Y=32
1130 U:*STAR
```

continued on next page

```
1140 C:#X=40
1150 U:*STAR
1160 R: OK THAT DID THE TOPS, NOW
FOR A FEW MORE
1170 C:#X=-48
1180 C:#Y=16
1190 U:*STAR
1200 U:*MIRRORSTAR
1210 C:#X=-32
1220 U:*STAR
1230 U:*MIRRORSTAR
1240 C:#X=-56
1250 C:#Y=0
1260 U:*STAR
1270 U:*MIRRORSTAR
1280 C:#X=-24
1290 U:*STAR
1300 U:*MIRRORSTAR
1310 C:#X=-65
1320 C:#Y=-20
1330 U:*STAR
1340 U:*MIRRORSTAR
1350 C:#X=-13
1360 U:*STAR
1370 U:*MIRRORSTAR
1380 R: HOW BOUT A FEW BALLS?
1390 C:#X=-43
1400 C:#Y=8
1410 U:*BALL
1420 U:*MIRRORBALL
1430 C:#X=-50
1440 C:#Y=-10
1450 U:*BALL
1460 U:*MIRRORBALL
1470 C:#X=-33
1480 C:#Y=-12
1490 U:*BALL
1500 U:*MIRRORBALL
1510 R: TREES DRAWN, SET UP TYPING,
 COLOUR AND MUSIC LOOP
1520 R:SPACE BETWEEN EACH CHARACTER
, HIT SPACE,ESC,ESC,SPACE BETWEEN E
ACH WORD AND SPACE,ESC,ESC,SPACE,ES
C,ESC AT E
1530 C:$MESSAGE=H A V E A H A P P Y
 H O L I D A Y !
1540 J:*MAINLOOP
1600 R:
1610 R:        TREE
1620 R:
1630 *TREE
1640 R: NEXT LINE SETS "BLUE" PEN
TO GREEN
1650 C:@B710=(12*16)+6
1660 GR:PEN BLUE
1670 GR:GOTO #X+28,#Y+5
1680 GR:TURNTO 0
1690 GR:TURN -26
1700 GR:DRAW 63
1710 GR:TURN 232
1720 GR:DRAW 2
1730 GR:FILL 61
1740 R: DRAW THE TRUNK
1750 R: NEXT LINE SETS "RED" PEN TO
 BROWN
1760 C:@B708=(14*16)+(4)
1770 GR:PEN RED
1780 GR:GOTO #X+4,#Y
1790 GR:TURNTO 0
1800 GR:DRAW 4
1810 GR:PEN ERASE
1820 GR:GOTO #X-4,#Y-1
1830 GR:PEN RED
1840 GR:FILL 5
1850 E:
1900 R:
1910 R:        STAR
1920 R:
1930 *STAR
1940 GR:PEN YELLOW
1950 GR:GOTO #X,#Y
1960 GR:TURNTO 0
1970 GR:DRAW 4
1980 GR:TURN 180
1990 GR:DRAW 2
2000 GR:TURN 90
2010 GR:DRAW 2
2020 GR:TURN 180
2030 GR:DRAW 4
2040 E:
2100 R:
2110 R:        MIRRORSTAR
2120 R:
2130 *MIRRORSTAR
2140 C:#X=(#X*-1)+1
2150 U:*STAR
2160 E:
2200 R:
2210 R:        BALL
2220 R:
2230 *BALL
2240 GR:PEN YELLOW
2250 GR:GOTO #X,#Y
2260 GR:TURNTO 0
2270 C:#A=0
2280 *STARTBALL
2290 C:#A=#A+1
2300 GR:4(DRAW #A;TURN90)
2310 J(#A<3):*STARTBALL
2320 GR:TURNTO 270;PEN BLUE;DRAW 1
2330 GR:1(TURN 90;PEN YELLOW;DRAW 2
;PEN BLUE;DRAW 2)
2340 GR:3(TURN 90;DRAW 1;PEN YELLOW
;DRAW 2;PEN BLUE;DRAW 2)
2350 E:
2400 R:
2410 R:        MIRRORBALL
2420 R:
2430 *MIRRORBALL
2440 C:#X=(#X*-1)+1
2450 U:*BALL
2460 E:
```

ERRATA
These lines were left off the Pilot listing in ANTIC #4.

```
1500 R:SET G FLAG FOR BAD NOTE
1510 CN:#G=1
1520 EN:
1530 A(#C=6):=$NOTE
1540 M(#C=6):!
1550 EY(#C=6):
1560 POSN(#C=6):2,22
1570 TN(#C=6):TOO MANY VALUES:$NOTE
1580 CN(#C=6):#G=1
1590 EN(#C=6):
1600 POS(#C>6):2,22
1610 T(#C>6):TOO MANY VALUES: $NOTE
1620 C(#C>6):#G=1
1630 E(#C>6):
1640 A:=$NOTETABLE
1650 MS:$NOTE.
1660 A:=$RIGHT
1670 MS:/
1680 C:$NOTEVALUES=$NOTEVALUES$LEFT
1690 E:
```

A SPEECH SYNTHESIZER ON A DISK!



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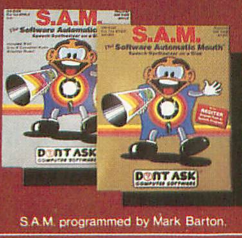
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Grafix

by TIM McGUINNESS

The graphics capabilities of the ATARI computers are very powerful, but seem mysterious to many ATARI owners. I am going to show you some tricks that can be used to do some professional graphics work, and from BASIC no less!

Some new, and older, software products get amazing results, especially when used together. I have developed a few routines to fit these together in *your* programs. For fuller discussion of the ATARI's graphics, refer to *De Re Atari*, or other publications of that kind.

Among the better graphics programs available are: *Micropainter* by DataSoft, *Graphics Master* by DataSoft, *Graphics Composer* by Versa Computing, *Graphics Generator* by DataSoft, and *The Next Step* by Sierra / On Line. Also, included in my toolbox is a product called *Versawriter* by Versa Computing. These are not the only graphics products on the market. It is just that these are the only ones I possess.

Versawriter, to the best of my knowledge, is the only graphics digitizer tablet available for the ATARI. An articulated arm mounted in a plastic tablet transmits the position of its locating head to the computer. The digitizer connects to ATARI Port 4. Included with the Versawriter are programs which allow you to trace a drawing from almost any original and convert it to a display in Graphics Mode 8 on the screen. Other included utilities are: Graphics 7 drawing, a text writer for Gr. 7 or 8, and calibration (which is critical!). The product, though, is somewhat out of the normal consumer price range at $300.00.

The Next Step has two functions. One is a color pallette to examine various color combinations, and the other is a character editor for a set of 128 characters. There are some serious display bugs in this program, but it does work well. There is some question about continued availability of this product, so get it while you can. The palette program seems of little real use, but the character editor has some features that make it worth having. You can load and save character sets to and from files on the disk, but the program also writes BASIC *code* for you, which can be included in *your* program using the command ENTER. Also, as you edit a given character the program displays the ATASCII value associated with that character. The program sells for about $35.00.

Graphics Generator is one program that every serious Atari programmer should have. This is a character-set editor with special features. It allows the user to edit or define up to five different character sets at a time, and to create character matrices. A character matrix is a group of characters which can be used to construct a complex object on the screen. Graphics Generator creates up to 26 matrices of up to 32 characters each, and allows them to be edited or merged. DataSoft deserves congratulations for this product, which sells for about $40.00.

Graphics Composer contains some very useful additions to the Versawriter program package. Besides the same Gr. 7 and Gr. 8 drawing utilities, it has a geometric-shape-drawing utility for circles, squares, rectangles, polygons, triangles, arcs, and moire patterns. Also included is an excellent Player editor, allowing the editing of two side-by-side players, with an enlarged viewing area for simplified editing. It includes the ability to load or save Player data directly to disk. This alone makes it worth having. The product sells for about $40.00.

Graphics Master, also by DataSoft, is a Gr. 8 drawing product. It has three modes: Edit, Draw, and Text. Edit mode manipulates images using an Edit window, adjustable to a variety of sizes. The window can "grab" images on the screen and then enlarge, reduce, skew, or rotate them. Draw mode allows line drawings with various geometric shapes. Text mode allows the placement of text anywhere on the screen in the standard text, or from special sets loaded from disk. This product also permits two screens to be created at one time, and even overlaid upon each other. This is an excellent product, and sells for about $40.00.

Micropainter is basically a drawing product, allowing creation of screen images in the four-color Antic E Mode (Gr. 7.5). This has the vertical pixel size of Gr. 8; but the horizontal width of Gr. 7, with four real colors. You can select between a full screen to create your image, or a magnified view of a small portion of the screen. You can draw in any one of the four colors, or you can combine

continued on page 44

Tim McGuinness is owner of the software publishing company, Renegade Technology.

them in horizontal, vertical, or checkerboard patterns. The program includes a high-speed fill function, to make the task of coloring much easier. One real problem is that the documentation was designed for children. Micropainter sells for about $40.00.

Techniques

These basic tools can be used to simplify your graphics creation jobs. Lets start with character sets, and the editors. As most of you know, the ATARI has its normal character set located in Read-Only-Memory. But, with just a POKE or two, you can direct your machine to some other character set located in the user RAM space. If you want to create and load this set yourself, you can, or you can have the computer do most of the work.

To edit or create a given character, I prefer the Graphics Generator. Simply follow the easy product instructions. Once you have created the perfect character set, save it to disk. Then use The Next Step to translate it to BASIC code for you.

You still need to do something useful with this new set in your program. Many well-known products use this technique ("Eastern Front" by Chris Crawford, for example). Character matrices are much the same. Use Graphics Generator to create a matrix, that is, define the characters and their relationship to one another. Then edit them one by one, or as a complete matrix, save them to disk, and load them into The Next Step. This time you will have to keep track of each character your matrix used.

Alternatively, you can follow the demo provided with Graphics Generator to load the matrix into your program directly from disk.

Creation of screen images is more time consuming, but not much more difficult than the creation of character sets. I find it hard to draw free-hand images using a joystick. It is much easier to draw on paper first and use the Versawriter to trace the drawing into the system. Trace the drawing by using one foreground color, and follow the pattern of your drawing. Don't try to make it perfect yet. Save the drawing to disk. If geometric shapes are to be part of the image, then add them with Graphics Composer and save this screen to disk. Change file names each time a new screen is saved to disk. This will record the changed file, and leave an unmodified backup. It would be a good idea to use a number in the file extention; like 1, 2, 3, etc.

Use the Graphics Master next to convert (shift) the Versa products screen image file to the DataSoft format used by Graphics Master and Micropainter. At this point you can add text to your screen, or manipulate the design using Graphics Master. However, it is generally best to refine the screen first using Micropainter. After finishing with Graphics Master, save the screen image to disk, using a new extender.

Now Micropainter is used, and your screen file is loaded. The process of conversion from a Gr. 8 (Antic F) Mode used with the Versa products to an Antic E screen used by Micropainter, randomly assigns the foreground pixels to one of the three foreground color registers. Therefore, it is now necessary to convert your previously-traced drawing to a single foreground color. This is done by re-drawing those pixels (dots) that you want to change.

Now refine the screen image to your liking, and add the appropriate colors. If you wish, you can save this screen and go back to Graphics Master to add text. Your final screen image is saved to disk, and can then be used as a title page, as a complex background over which Players can be moved, etc.

To use these screen or display files, you will need two utility routines. One of these is a screen-file loader, and the other is an Antic E converter. These are provided in Listings 1, 2, and 3. Listing 1 is the BASIC code to load the screen file using the Assembly program contained in Listing 2. Listing 3 is a routine to convert the loaded screen file's display list to Antic E mode. After conversion, simply adjust the color registers for the correct colors (Registers 0, 1, 2, and 3).

This may sound like a lot of work, but it really is not. Most screens can be completed in an hour or less, with far better results than if you used a single product, drawing free-hand by joystick, or even used the Versawriter alone. I think you will be very pleased with this approach.



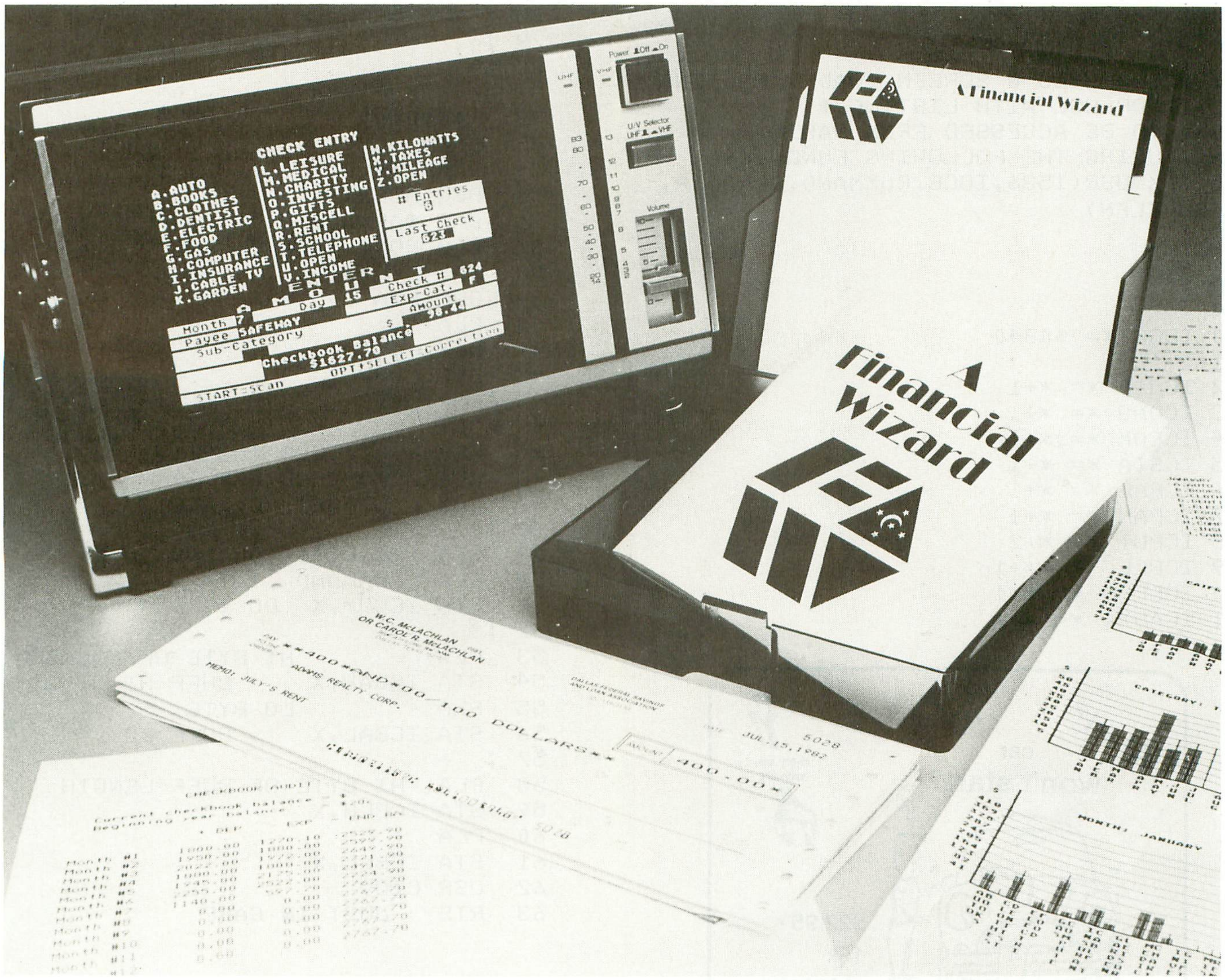
GRAPHIC PROOF—An example of the graphic work possible using the tools described in this article, created by the author.

Listing 1

```
1000 REM SCREEN FILE LOAD UTILITY
1010 DIM BGET$(50),FILE$(20)
1020 IOCBNO=1
1030 REM FILE NAME= DISK:FILE.EXT
1040 FILE$="FILE NAME HERE"
1050 OPEN #IOCBNO,4,0,FILE$
1060 OPEN #2,4,0,"D:UTILITY.OBJ"
  :INPUT #2;BGET$:CLOSE #2
1070 GRAPHICS 8+16:SETCOLOR 2,0,0
1080 SCRN=PEEK(560)+256*PEEK(561)
1090 SCRN=PEEK(SCRN+4)+256*PEEK(SCRN+5)
1100 BGET=ADR(BGET$)
1110 LET COMMAND=7
1120 LET BUFFLEN=192*40
1130 IOCB=IOCBNO*16
1140 GRAPHICS 8+16:SETCOLOR 2,0,0
1150 SCRADDR=SCRN
```

continued on page 46

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```
1160 X=USR(BGET,IOCB,COMMAND,SCRADDR,
  BUFFLEN)
1170 CLOSE #IOCBNO
1180 RETURN
```

Listing 2

```
01 ; GRAPHICS 8 SCREEN LOADER ROUTINE
02 ; FOR USE WITH LISTING #1
03 ; TO BE ACCESSED FROM BASIC
04 ; USING THE FOLLOWING FUNCTION
05 ; X=USR(1536,IOCB,COMMAND,SCRADDR,
  BUFFLEN)
06 ;
07 ;
08 ;
09 ;
10 IOCB *= $0340
11 ;
12 ICHID *= *+1
13 ICDNO *= *+1
14 ICCOM *= *+1
15 ICSTA *= *+1
16 ICBAL *= *+1
17 ICBAH *= *+1
18 ICPUT *= *+2
19 ICBLL  *= *+1
20 ICBLH  *= *+1
21 ICAUX1 *= *+1
22 ICAUX2 *= *+1
23 ICAUX3 *= *+1
24 ICAUX4 *= *+1
25 ICAUX5 *= *+1
26 ICAUX6 *= *+1
27 CIOV   = $E456  CIO VECTOR
28 ;
29 ;
30 ;
31 ARGNUM = $04
32   *=$0600
33   PLA
34   CMP #$00
35  BEQ ABORT
36  CMP #ARGNUM
37  BEQ CONT
38  TAY
39 LOOP PLA
40  PLA
41  DEY
42  BNE LOOP
43 ABORT RTS
44 CONT
45  PLA    HI IOCB TOSS IT
46  PLA    LO IOCB USE IT
47  TAX    OFFSET TO IOCB
48 ;
49  PLA  HI BYTE COMMAND TOSS IT
50  PLA  COMMAND !!
51  STA ICCOM,X  DO IT
52 ;
53  PLA           HI BYTE OF COMMAND
54  STA ICBAH,X      BUFF HI
55  PLA           LO BYTE
56  STA ICBAL,X      BUFF LO
57 ;
58  PLA  HI BYTE OF BUFF LENGTH
59  STA ICBLH,X
60  PLA
61  STA ICBLL,X
62  JSR CIOV
63  RTS   JUST IN CASE
```

Listing 3

```
2000 REM GR.7+ OR ANTIC E
2010 REM CONVERSION ROUTINE
2020 REM
2030 DLIST=PEEK(560)+256*PEEK(561)
2040 POKE DLIST+3,14+64
2050 REM CONVERSION LOOP
2060 REM CONVERTING GR.8 TO GR.7+
2070 FOR CONV=DLIST+6 TO DLIST+6+192
2080 IF PEEK(CONV)=15 THEN POKE CONV,
  14:REM GR.8=15; GR.7+=14; GR.7=13
2090 IF PEEK(CONV)=79 THEN POKE CONV,
  78:REM GR.8=79; GR.7+=78; GR.7=77
2100 NEXT CONV
2110 REM CONVERSION COMPLETE
2120 REM NOW SET COLORS FOR 0,1,2,3
2130 RETURN
```

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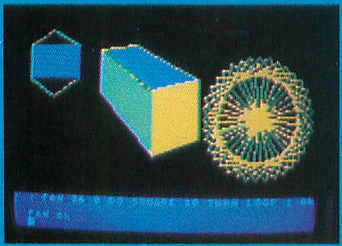
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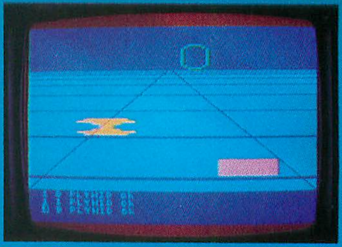
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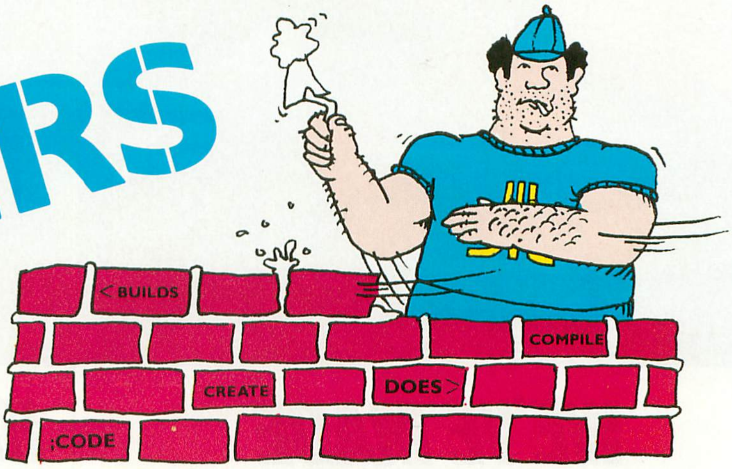
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DEFINERS



by BOB GONSALVES

The powerful facility of *defining words* allows the Forth programmer to define application-specific data types, with associated execution procedures.

If you have programmed in Forth at all, you've used these defining words : (colon), VARIABLE and CONSTANT. These words are used to create specific *instances* of colon-definitions, variables and constants. In fig-Forth, we can create other defining words in the following way.

: *name* < BUILDS *compile-time code*
DOES > *run-time code*

Three points to be noted are:

1) *name* is whatever you want to call your defining word;
2) the *compile-time code* is any sequence of Forth words, which specifies the way an instance will be compiled into memory;
3) the *run-time code* specifies the execution procedure for instances, when they are used. The first operation to be done leaves the first storage address of the instance on the stack, for use by the rest of the DOES position of the defining word. Then, the *run-time code* executes.

As an example, we would create the following defining word

```
: ByteArray<builds allot does> + ;
```

To compile a specific instance, we could type

```
300 ByteArray TESTER
```

to create an array with 300 bytes alloted to it. (The locations are not set to any particular value.) To use our instance, we can type

```
53 TESTER
```

so that the offset 53 is added to the first storage address, leaving the address of the *53rd* byte in TESTER.

ATARI Examples

As you may know, the ATARI Operating System supports communication with peripheral devices through data structures called I/O Control Blocks. The eight control blocks consist of 16-byte arrays in memory, with each location in the array serving a fixed function. Listing 1 shows some words I use to manipulate control blocks. In this example, all the words defined by SERVES.AS execute by leaving an address on the stack. This address is the storage address for the COMMAND byte, STATUS byte, etc., associated with a particular control block.

Now, how do we use those instances? First, we must decide which control block we are referencing by storing the control-block number into IOCB#. After that point, all references using COMMAND, AUX1, etc., will refer to that particular control block. The GETCHR definition shows one way to create a generalized routine, that can be applied to different control blocks by changing the value of IOCB#. Another situation where these instances have been useful is as macros for assembly language routines.

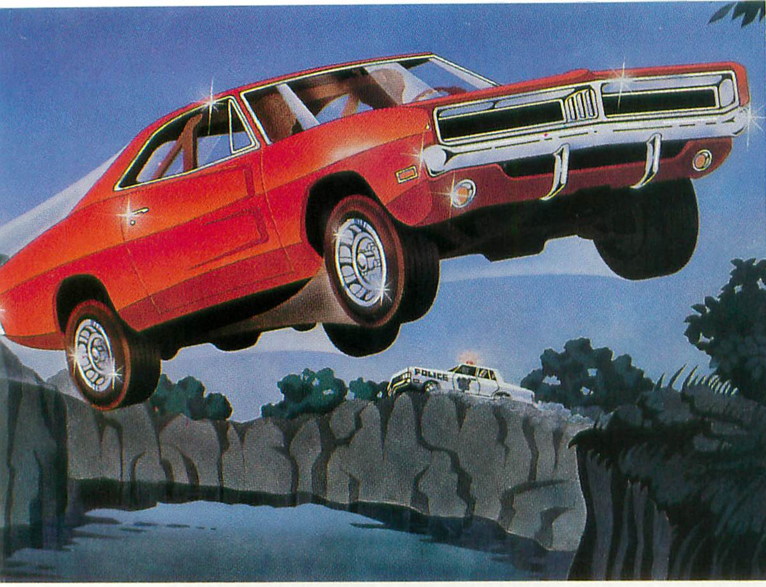
Listing 2 illustrates a similar technique, applied to a four-voice sound sequencer. Another area where this style has been applied is in the creation of attributes associated with Player/Missile graphic images.

Principles

These examples point out three aspects of good program design.

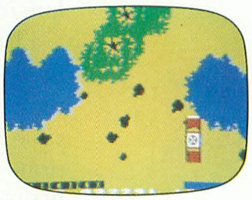
1) Similarity: To save space and unnecessary typing, try to gather similar structures or execution activities into one definition only.
2) Locality: Once we start referencing one particular object in memory, it's likely that we will continue referring to it for the next few operations.
3) Generality: The routines you can define are independent of the particular control block, voice, player, that you are manipulating.

See page 51 for listing.



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FORTH *listing*

```
( 60 ANTIC ISSUE #5  SCREEN #1        )
0 VARIABLE IOCB# ( AN INDEXING GLOBAL VA
RIABLE )

: IOCBX IOCB# @ 16 * ;
  ( BYTE OFFSET FROM IOCB 0 )

HEX
CODE CALL-CIO
XSAVE STX, 0 ,X LDA, TAX, ( TOP STACK IN
TO X REG)
E456 JSR, XSAVE LDX, POP JMP, ( CIO VECT
OR DROP TOP STACK )
END-CODE

: SERVES.AS ( DEFINING WORD )
  <BUILDS , ( COMPILE BASE ADDR FOR CONT
ROL BLOCK 0)
   DOES> @ IOCBX + ; ( GET BASE ADDR ADD
 OFFSET )

( 61 ANTIC #5                          )
( BUILD ACCESS WORDS )
HEX
342 SERVES.AS COMMAND ( BYTE LOCATION )
343 SERVES.AS STATUS  ( BYTE )
344 SERVES.AS BUFF-ADDR ( 16BIT WORD )
348 SERVES.AS BUFF-LEN  ( WORD )
34A SERVES.AS AUX1  ( BYTE )
34B SERVES.AS AUX2  ( BYTE )

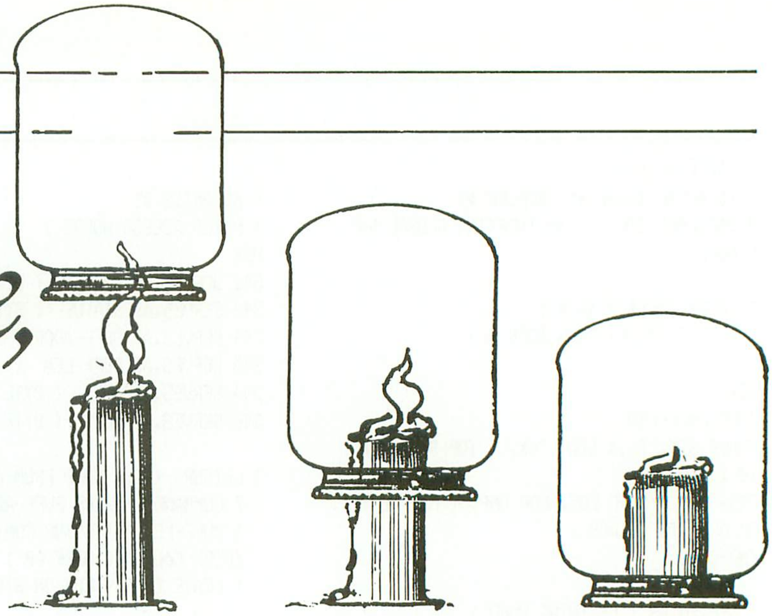
: GETCHR  ( GET CHAR FROM ANY DEVICE)
  7 COMMAND C! HERE BUFF-ADDR !
  1 BUFF-LEN ! ( SETUP CONTROL BLOCK )
  IOCBX CALL-CIO HERE C@ ;
  ( LEAVE CHAR VALUE ON STACK )

( 62 ANTIC #5                          )
0 VARIABLE V#  ( INDEXING VARIABLE )
: VOICE V# ! ;
: SOUNDS ( ARRAY OF VALUES )
  <BUILDS HERE OVER ERASE ALLOT ( CLEAR
LOCATIONS )
  DOES> V# @ + ; ( GET BYTE LOCATION REL
ATIVE TO V# )

( VALUES ARE COMBINED AND SENT TO HARDWA
RE REGISTERS )
4 SOUNDS VOLUME
4 SOUNDS PITCH
4 SOUNDS DISTORTION

( ARRAY USED BY 4 VOICE SEQUENCER      )
4 SOUNDS BUSYFLAG
4 SOUNDS SEQUENCELENGTH
4 SOUNDS CURRENTSTEP
4 SOUNDS SEQUENCEPOINTER  ( WHICH ARRAY
PROVIDES VALUES FOR V/P/D )
```

Candle, Candle, Burning Bright



by LINDA SCHREIBER

Most computers owned by schools are used in the Math department, a recent survey showed. Computer Science ranked second. The prime use for computers in any shool is drill and practice.

In drill and practice, the computer gives the student questions. If the questions are answered correctly, the student is rewarded. If the answer is wrong, the correct answer appears on the screen. Some educators frown on this, calling it "electronic flash cards." Others praise such programs, stating that they aid the teacher by reinforcing facts that children need to know.

Another type of educational software is the tutorial, where the computer "teaches" a particular lesson. Some tutorial programs make the computer an electronic page-turner; others allow the students to learn at their own pace, test the students, then review material or present new material based on the results of the test.

Some programs are advertised as educational games. They present learning as a *fun* experience. Some vendors will advertise a game as educational, if any single thing is learned. Arcade games are even called educational because they teach "hand-eye coordination." Maybe they do, but does this mean that they are truly an educational game?

There is another educational category — simulation. This is one area where computers could be used to better advantage. There are very few good simulation programs available.

Our program this issue simulates a science experiment. A candle is drawn on the screen, and a jar is hovering above it. The program is very simple. To light the candle, press [SELECT]. To lower or raise the jar, press [START]. The candle cannot be lit if the jar has been lowered, but the jar can be lowered or raised whether or not the candle is lit. The white dots that move around on the screen represent the oxygen in the air.

This is a fairly standard experiment, and with a program like this, young children can learn about their environment safely. To light the candle, press [SELECT] and hold it down until the flame appears above the candle. The oxygen dots will move around on the screen. The flame on the candle will flicker because of the air movement.

Hold down the [SELECT] button until the jar starts to move. Once the jar is over the candle, the oxygen will begin to disappear. The oxygen still moves in the jar and the flame will flicker. When all the oxygen is used up, the flame will go out.

Hold down the [START] button until the jar starts to move up again. Notice that the oxygen dots will appear around the candle. If the jar is raised just before all the oxygen is used up, more oxygen dots will gather around the candle, and the flame will not go out.

This program uses the Player/Missile graphics for the jar, candle and the flame. Lines 50 & 60 contain the machine language to move the player (jar) up and down. Be sure that these lines are typed in exactly, or the program will not work correctly.

Linda Schreiber is president and co-owner of T.H.E.S.I.S., one of the first firms developing software for the ATARI. Her book on programming the ATARI computer will be published soon by TAB Books, Inc. She is the vice-president of SEMCO, Detroit's oldest computer club, and a member of MACE, one of the fastest growing ATARI user's groups.

VARIABLES USED IN THIS PROGRAM

UP$	= machine language subroutine to move player up
DOWN$	= machine language subroutine to mover player down
A	= free memory less 8K
PMBASE	= beginning of the memory for players and missiles
CANDLE	= memory location of where the candle will be drawn.
FLAME	= memory location of where the flame will be drawn.
JAR	= memory location of where the jar will be drawn.

C	= column where oxygen will be plotted
R	= row where oxygen will be plotted
OS(50,2)	= column and rown of oxygen on screen.
OJ(10,2)	= column and row of oxygen under jar.
FL	= state of flame (1 = flame lit, 0 = flame out).
JU	= state of jar (1 = jar down, 0 = jar up).
OX	= amount of oxygen visible.
F	= which of the three flames to draw.
B	= data being read
X,Q,M	= dummy variables

```
10 REM SIMULATION FOR ANTIC - DECEMBER
 1982 - 16K ATARI
20 REM BY LINDA M. SCHREIBER
30 DIM OS(50,2),OJ(10,2),UP$(13),DOWN$
(13)
40 A=PEEK(106)-32:REM SET ASIDE 2K FOR
 PLAYER/MISSILE GRAPHICS - GRAPHICS 7
NEEDS 4K
50 UP$="h  H1M  MHPw ":REM h,reverse s
pace,ctrl comma,reverse H1M,reverse ct
r H,reverse ctrl Q,reverse MHPw,ctrl .

55 REM end with ctrl period
60 DOWN$="h   1MH M Pw ":REM h,reverse
 space, escape-ctrl insert,reverse ctr
l H,reverse 1MH, reverse ctrl Q
65 REM reverse M, reverse ctrl H,rever
se Pw, ctrl period
70 GRAPHICS 7:REM HIGH RESOLUTION WITH
 TEXT WINDOW
80 POKE 54279,A:PMBASE=A*256:REM TELL
ANTIC WHERE P/M GRAPHICS BEGIN
90 POKE 559,62:POKE 53277,3:REM ENABLE
 P/M GRAPHICS FOR SINGLE LINE RESOLUTI
ON
100 POKE 704,104:REM COLOR OF FLAME
110 POKE 705,200:REM COLOR OF CANDLE
120 POKE 706,120:REM COLOR OF JAR
130 POKE 708,154:REM COLOR OF OXYGEN
140 POKE 709,8:REM COLOR OF DISH
150 FOR X=PMBASE+1024 TO PMBASE+2043:P
OKE X,0:NEXT X:REM CLEAR MEMORY FOR GR
APHICS

160 COLOR 2:PLOT 100,75:DRAWTO 110,70:
DRAWTO 40,70:POSITION 50,75
170 POKE 765,2:XIO 18,#6,0,0,"S:"
180 CANDLE=PMBASE+1426:REM LOCATION OF
 CANDLE IN P/M MEMORY
190 RESTORE 510:FOR X=0 TO 25:READ B:P
OKE CANDLE+X,B:NEXT X:REM READ IN THE
DATA FOR CANDLE
200 POKE 53249,120:REM PUT CANDLE ON S
CREEN
210 FLAME=PMBASE+1157:REM LOCATION OF
FLAME IN P/M MEMORY
220 JAR=PMBASE+1606:POKE 206,INT(PMBAS
E+1536)/256:POKE 205,(PMBASE+1536)-INT
((PMBASE+1536)/256)*256:REM JAR IN P/M

230 POKE JAR,255:FOR X=1 TO 50:POKE JA
R+X,129:NEXT X:REM DRAW THE JAR
240 POKE 53258,3:POKE 53250,107:REM PU
T THE JAR ON THE SCREEN
250 COLOR 1:FOR X=1 TO 50:REM PUT OXYG
EN ON SCREEN
260 C=INT(RND(1)*160):REM COLUMN OF OX
YGEN
270 R=INT(RND(1)*80):REM ROW OF OXYGEN

280 IF C>60 AND C<90 THEN IF R>43 THEN
 270:REM DON'T PLACE IT IN THE JAR
290 IF C>40 AND C<110 THEN IF R>69 THE
N 270:REM OR ON SAUCER
300 OS(X,1)=C:OS(X,2)=R:REM PLACE THE
OXYGEN LOCATION IN THE ARRAY
310 PLOT C,R:NEXT X:REM DO IT 50 TIMES

320 FOR X=1 TO 10:REM OXYGEN IN JAR
330 C=INT(RND(1)*23)+63:R=INT(RND(1)*2
3)+46:REM AREA OF JAR
340 OJ(X,1)=C:OJ(X,2)=R:REM PLACE IN J
AR ARRAY
350 PLOT C,R:NEXT X:OX=10:REM DO IT 10
 TIMES
360 POKE 752,1:? "PRESS START TO MOVE
JAR":? :? "PRESS SELECT TO LIGHT CANDL
E";:REM INSTRUCTIONS
370 IF PEEK(53279)=7 THEN 400:REM NO K
EY PRESSED - MOVE OXYGEN & FLAME IF LI
T
380 POKE 77,0:IF PEEK(53279)=5 AND FL=
0 AND JU=0 THEN 410:REM TURN OFF ATTRA
CT - LIGHT FLAME?
390 IF PEEK(53279)=6 THEN GOSUB 430:IF
 JU=0 THEN COLOR 1:FOR X=1 TO 10:PLOT
OJ(X,1),OJ(X,2):NEXT X
400 IF FL=0 THEN GOSUB 540:GOTO 370:RE
M FLAME NOT LIT
410 FL=1:POKE 53248,120:GOSUB 520:REM
ANIMATE FLAME ON SCREEN
420 GOTO 370
430 IF JU=0 THEN FOR Q=1 TO 51:M=USR(A
DR(DOWN$)):NEXT Q:JU=1:RETURN :REM MOV
E JAR DOWN
440 FOR Q=1 TO 51:M=USR(ADR(UP$)):NEXT
 Q:JU=0:OX=10:RETURN :REM MOVE JAR UP
500 REM DATA FOR CANDLE
510 DATA 8,8,12,28,28,30,62,62,126,126
,126,126,126,126,126,126,126,126,126,1
26,126,126,126,126,126,126
520 F=INT(RND(1)*3)+1:REM PICK ONE OF
THREE FLAME POSITIONS
530 RESTORE 530+F:FOR X=0 TO 9:READ B:
```

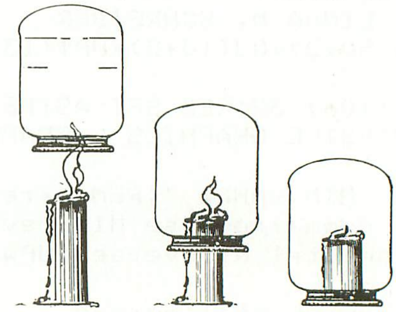
continued on next page

```
POKE FLAME+X,B:NEXT X:REM READ IN THE
DATA FOR FLAME
531 DATA 16,8,12,28,62,62,28,24,8,4
532 DATA 8,4,6,12,60,60,28,48,16,8
533 DATA 32,16,24,56,30,30,12,12,4,2
539 REM DECREASE THE OXYGEN IF FLAME I
S ON AND JAR IS DOWN. FLAME GOES OUT W
HEN THERE IS NO OXYGEN
540 IF JU=1 AND FL=1 THEN COLOR 4:PLOT
 OJ(OX,1),OJ(OX,2):OX=OX-1:IF OX=0 THE
N FL=0:POKE 53248,0:RETURN
550 IF OX=0 THEN 580:REM NO OXYGEN IN
JAR
560 FOR X=1 TO OX STEP 2:R=INT(RND(1)*
23)+63:C=INT(RND(1)*23)+46:COLOR 4:PLO
T OJ(X,1),OJ(X,2):OJ(X,1)=R:OJ(X,2)=C
570 COLOR 1:PLOT R,C:NEXT X
580 FOR X=1 TO 50 STEP 5:COLOR 4:PLOT
OS(X,1),OS(X,2):C=INT(RND(1)*160):REM
GET A NEW COLUMN
590 R=INT(RND(1)*80):IF C>60 AND C<90
THEN IF R>43 THEN 590:REM IN THE JAR!
600 IF C>40 AND C<110 THEN IF R>69 THE
N 590:REM ON THE SAUCER!!
610 OS(X,1)=C:OS(X,2)=R:COLOR 1:PLOT C
,R:NEXT X:RETURN
```

TYPO TABLE

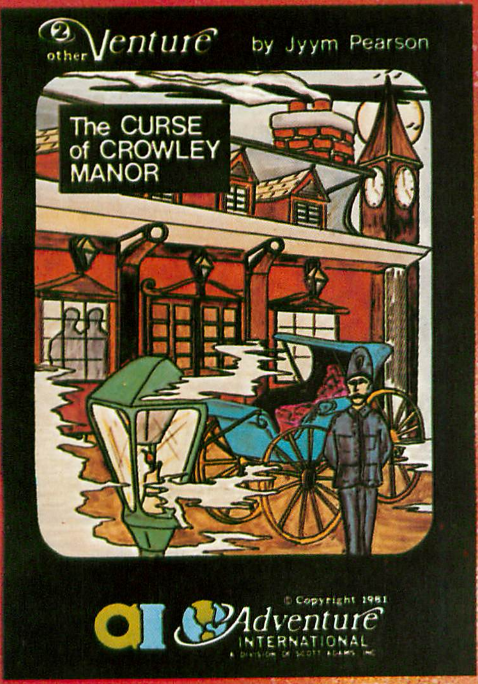
Variable checksum = 367255

Line num range	Code	Length
10 - 65	EV	535
70 - 160	SB	548
170 - 240	NG	536
250 - 330	RK	514
340 - 400	JQ	542
410 - 530	MN	517
531 - 560	AS	521
570 - 610	YD	345



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(FOR EXPERIENCED ADVENTURERS ONLY!)



THE CURSE OF CROWLEY MANOR

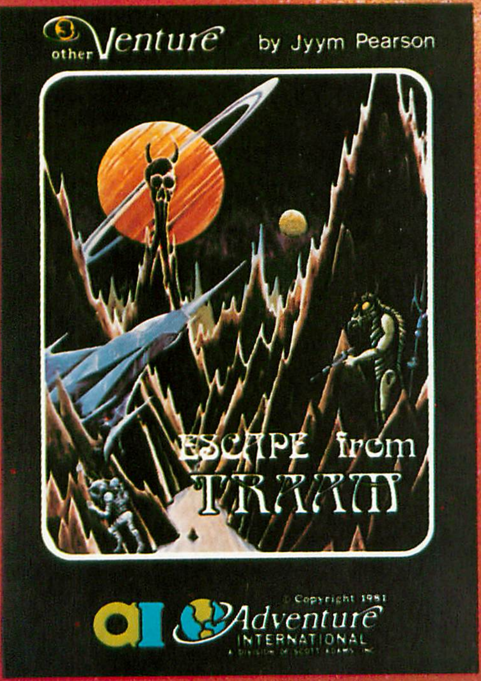
by Jyym Pearson

You've sensed it before: nameless, unreasoning fear. Fear of the unseen — of things that scurry and scrabble through the shadows when the lights have been put out. How then will you fare when you face the Ultimate Evil; how will you possibly survive — THE CURSE OF CROWLEY MANOR?

Jyym Pearson, author of ESCAPE FROM TRAAM and many other fine programs, explores a new dimension in fright with a macabre tale of things that go bump in the night. THE CURSE OF CROWLEY MANOR is an excursion into mind-wrenching terror as you enter the dreaded Crowley Estate in search of answers to some pretty grisly questions. Fear fans take note: This is the stuff that nightmares are made of, so think twice before you approach. . .

THE CURSE OF CROWLEY MANOR features Adventuring the way YOU like it, with plenty of clever plot twists, and a scenario that'll roll your socks up and down your legs! If Adventuring has become a bit tame for you lately, this is one sure-fire cure! THE CURSE OF CROWLEY MANOR will run on any ATARI 400 or 800 with ample memory. We supply the software; you supply the atmosphere. (A well-lit room is optional, but recommended!)

ATARI 16K TAPE 050-0108 $24.95



ESCAPE FROM TRAAM

by Jyym Pearson

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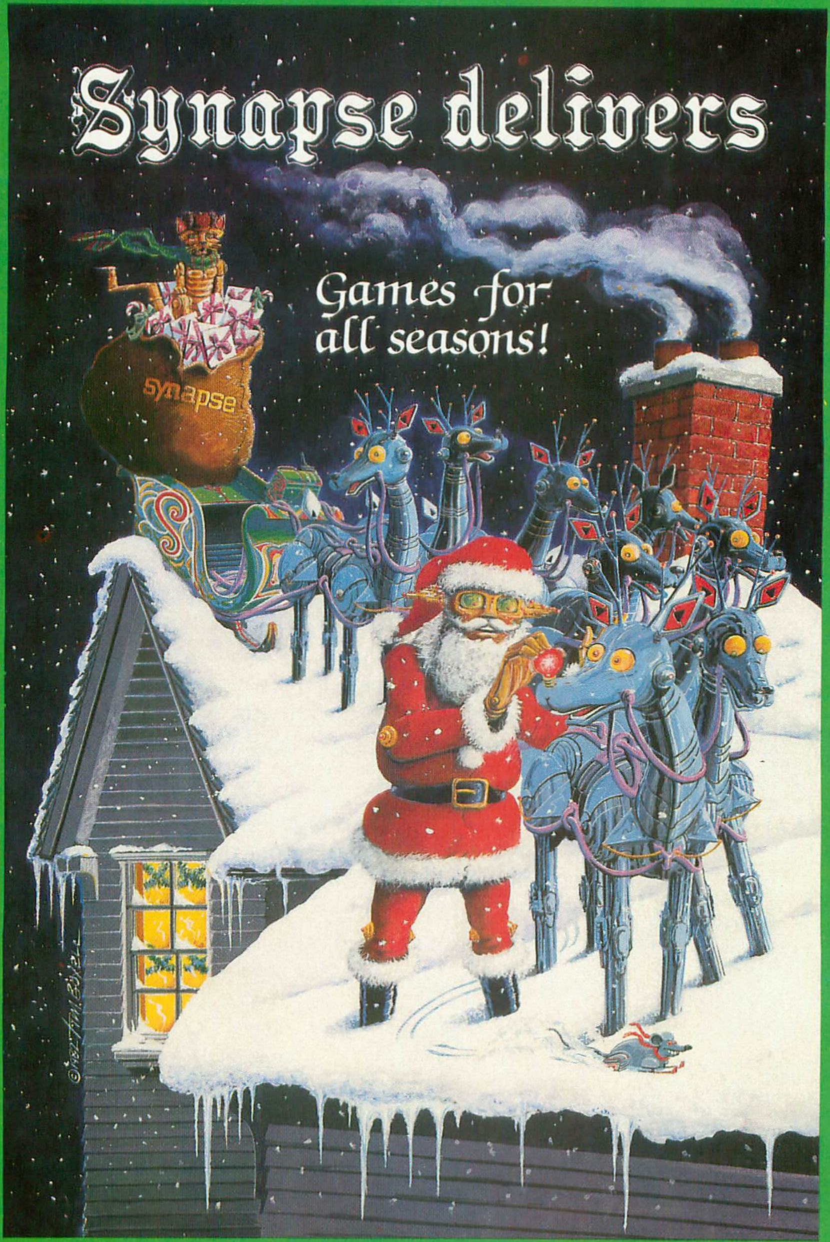
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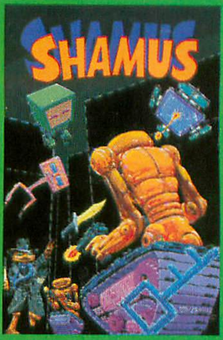
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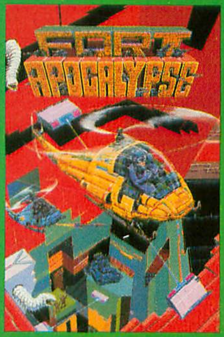
To order, see your local dealer. If he does not have the program, then call 1-800-327-7172 (orders only please) or write for our free catalog.

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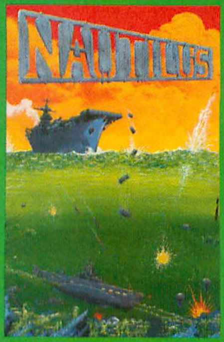


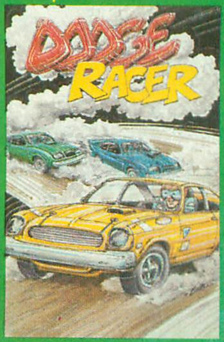


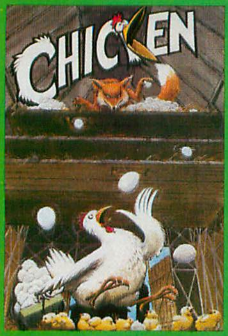


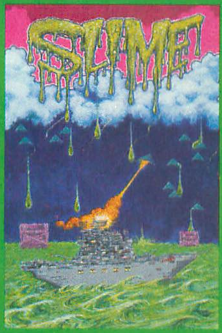




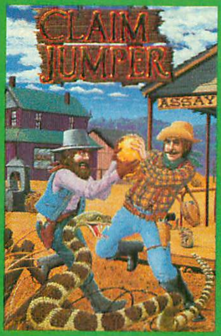












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Many titles soon available for the VIC 20, VIC 64, and IBM-PC.

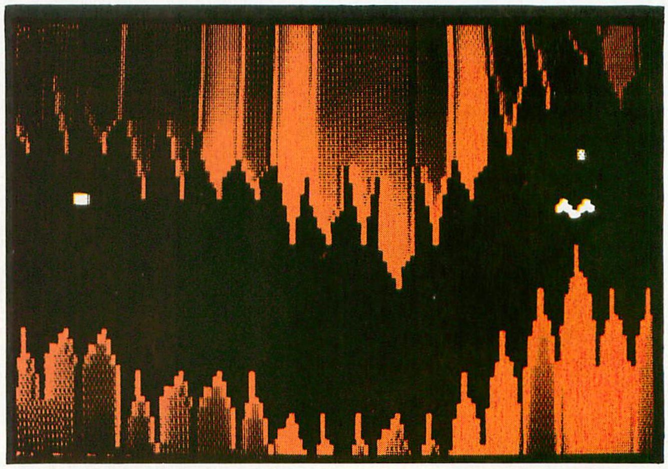
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SOFTWARE

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BATS



by STAN OCKERS

This game for one or two players needs only a joystick and 16K. The object is to fly your bat through a cavern while avoiding the walls and eating insects. You score points for every insect eaten. Pressing the fire button causes your bat to fly higher, releasing it causes the bat to fall. Your bat always flys steadily forward. You start over after you either score 300 points or you lose a bat. You lose all points if you hit a stalagtite. There are poison bugs, the color of your bat. Eat one of these and your bat dies, you lose all points, and 100 penalty points are deducted.

The cavern narrows as the game progresses. You get a bonus bat for every 1000 points, with four bonus bats maximum. The game ends when all bats are dead.

Thanks again to Stan for an excellent game. Bats was first published in the ATARI club newsletter of Eugene, OR. If you're interested, write: A.C.E., c/o Mike Dunn, 3662 Vine Maple Drive, Eugene, OR 97405

```
 10 REM **       BATS
    **
 20 REM ** STAN OCKERS 3-82
    **
 30 DIM ZZ$(32):FOR I=1 TO
    32:READ A:ZZ$(I)=CHR$(A
    ):NEXT I:GOSUB 1250:CLR

 40 DATA 104,104,133,204,10
    4,133,203,104,133,206,1
    04,133,205,162,4,160,0
 50 DATA 177,203,145,205,13
    6,208,249,230,204,230,2
    06,202,208,240,96
 60 ? "PRESS ANY KEY TO STA
    RT":GOSUB 920
 70 TRAP 70:? "# PLAYERS ";
    :POKE 764,255:INPUT NP
 80 REM ** PM GRAPHICS **
 90 DIM D$(1),P$((INT(ADR(D
    $)/1024)+1)*1024-ADR(D$
    )-1),PM$(384),M$(128),P
    $(128),MM$(8)
100 RESTORE 110:FOR I=1 TO
    8:READ A:MM$(I)=CHR$(A)
    :NEXT I
110 DATA 3,3,12,12,48,48,19
    2,192
120 PM$=CHR$(0):PM$(384)=CH
    R$(0):PM$(2)=PM$:M$=PM$
    :P$=M$
130 REM ** MISSILE COLORS *
    *
140 POKE 704,14:POKE 705,39
    :POKE 706,54:POKE 707,7
    0
150 REM ** VBI ROUT. TO MOV
    E MISSILES **
160 FOR I=1536 TO 1566:READ
     A:POKE I,A:NEXT I
170 DATA 104,160,14,162,6,1
    69,7,76,92,228,90,120,1
    50,180,162,3,222,10,6,1
    89,10,6,157,4,208,202,1
    6,244,76,98,228
180 REM ** BAT IMAGES **
190 DIM BATDN$(5):BATDN$=P$
    :FOR I=2 TO 4:READ A:BA
    TDN$(I,I)=CHR$(A):NEXT
    I
200 DATA 24,165,66
210 DIM BATUP$(5):BATUP$=P$
    :FOR I=2 TO 4:READ A:BA
    TUP$(I,I)=CHR$(A):NEXT
    I
220 DATA 66,165,24
230 POKE 54279,ADR(PM$)/256
    :POKE 559,46:POKE 53277
    ,3:POKE 623,4:A=USR(153
    6)
240 REM ** STALACTITES AND
    STALAGMITES **
250 DIM C$(42),U$(42):C$="*
    ****$%******&":U$=")(**
    ***'******":FOR I=1 TO
    14:C$(I+14)=CHR$(ASC(C$
    (I))-32)
260 U$(I+14)=CHR$(ASC(U$(I)
    )-32):C$(I+28)=CHR$(ASC
    (C$(I))+128):U$(I+28)=C
    HR$(ASC(U$(I))+128):NEX
    T I
270 DIM P(NP),SCORE(NP),TOT
    AL(NP),BN(NP),BONUS(NP)
280 W=7:P=0:POKE 82,0
290 FOR I=1 TO NP:SCORE(I)=
    0:TOTAL(I)=0:BN(I)=3:BO
    NUS(I)=1000:NEXT I:NXTC
    V=300*NP
300 REM ** CHANGE WIDTH OF
    CAVERN **
310 IF W>3 THEN W=W-1
320 GOSUB 670
330 P=P+1:IF P>NP THEN P=1
340 IF BN(P)=0 THEN 330
350 M$=PM$:FOR I=0 TO 3:M$(
    YST+5*W+W*(3-I))=MM$(2*
    I+1,2*I+2):NEXT I
360 REM ** MAIN LOOP **
370 POKE 656,1:POKE 657,22:
    ? "  Pull Joystick"
380 IF STICK(0)<>13 THEN 38
    0
390 REM ** SCORECARD **
400 ? CHR$(125):GOSUB 1090:
    POKE 656,0:POKE 657,26:
    ? "PLAYER #";P
410 POKE 656,1:POKE 657,24:
    ? "Round   Total";:GOSU
    B 1110
420 POKE 53248,30:YPOS=YST+
    20:POKE 53278,0:T=0:DIS
    =12
430 FOR XPOS=47 TO 200:POKE
     53248,XPOS:IF STRIG(0)
    =0 THEN YPOS=YPOS-1:P$(
    YPOS)=BATUP$
440 IF STRIG(0)=1 THEN YPOS
    =YPOS+1:P$(YPOS)=BATDN$
450 IF PEEK(53256)>0 THEN P
    OKE 1546,0:TOTAL(P)=TOT
    AL(P)-100:GOTO 580
```

continued on next page



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```
460 IF PEEK(53257)>0 THEN P
    OKE 1547,0:GOSUB 1140
470 IF PEEK(53258)>0 THEN P
    OKE 1548,0:GOSUB 1140
480 IF PEEK(53259)>0 THEN P
    OKE 1549,0:GOSUB 1140
490 IF PEEK(53252)>0 THEN 5
    80
500 NEXT XPOS:P$=PM$
510 IF SCORE(P)<300 THEN 42
    0
520 TOTAL(P)=TOTAL(P)+SCORE
    (P):SCORE(P)=0:GOSUB 11
    20
530 IF TOTAL(P)>BONUS(P) AN
    D BN(P)<4 THEN BONUS(P)
    =BONUS(P)+1000:BN(P)=BN
    (P)+1:GOSUB 1090:DIS=10
    :T=30:GOSUB 800
540 FOR I=1 TO 30:GOSUB 113
    0:FOR J=1 TO 30:NEXT J:
    GOSUB 1110:NEXT I
550 IF P=NP THEN 310
560 GOTO 330
570 REM ** LOSE A BAT **
580 DIS=10:T=9:GOSUB 800
590 YPOS=YPOS+1:P$(YPOS)=BA
    TDN$:POKE 53278,0:SOUND
     1,YPOS,10,10:IF PEEK(5
    3252)=0 THEN 590
600 GOSUB 810:P$=PM$:SCORE(
    P)=0:BN(P)=BN(P)-1:GOSU
    B 1090:IF BN(P)=0 THEN
    POKE 656,0:POKE 657,6:?
     "  ":GOSUB 840
610 GOSUB 1100:FOR I=1 TO N
    P:IF BN(I)>0 THEN 540
620 NEXT I:GOSUB 1160:GRAPH
    ICS 17:POSITION 5,2:? #
    6;"GamE OveR":FOR I=1 T
    O NP:POSITION 3,2+2*I:?
     #6;"Player #";I;
630 ? #6;" = ";TOTAL(I):NEX
    T I:POSITION 3,23:? #6;
    "PRESS ANY KEY";
640 FOR I=1 TO 300:NEXT I:G
    OSUB 830:IF FL=0 THEN 6
    40
650 GOTO 280
660 REM ** DRAW CAVERN **
670 GOSUB 1160:GRAPHICS 2:G
    OSUB 1180:POKE 77,0
680 DL=INT(RND(0)*(8-W))+1:
    YST=8*(DL+1)
690 FOR X=0 TO 19:GOSUB 780
    :Y=0:FOR I=R+7-DL TO R+
    6:POSITION X,Y:? #6;C$(
    I,I):Y=Y+1:NEXT I
700 FOR I=1 TO W:POSITION X
    ,Y:? #6;" ":Y=Y+1:NEXT
    I
710 IF DL+W>=10 THEN Y=Y-1:
    POSITION X,Y:? #6;"'":G
    OTO 730
720 GOSUB 780:FOR I=R TO R+
    9-DL-W:POSITION X,Y:? #
    6;U$(I,I):Y=Y+1:NEXT I
730 IF DL<=1 THEN DL=2:GOTO
     760
740 IF DL>=10-W THEN DL=9-W
    :GOTO 760
750 DL=DL+INT(RND(0)*3)-1
760 NEXT X
770 RETURN
780 R=INT(RND(0)*6)*7+1:RET
    URN
790 REM ** SOUND SUBR'S **
800 FOR I=15 TO 0 STEP -1:S
    OUND 0,I,DIS,I:FOR J=1
    TO T:NEXT J:NEXT I:RETU
    RN
810 FOR I=10 TO 2 STEP -2:S
    OUND 0,RND(0)*255,8,I:S
    OUND 1,RND(0)*255,8,I:F
    OR J=1 TO 30:NEXT J:NEX
    T I
820 SOUND 0,0,0,0:SOUND 1,0
    ,0,0:RETURN
830 RESTORE 1060:LS=30:LL=5
    :GOSUB 850:RETURN
840 RESTORE 1010:LS=20:LL=1
    0
850 FL=0
860 READ I,J:IF I=3 THEN RE
    TURN
870 IF I=0 THEN 900
880 IF PEEK(53775)<255 THEN
     FL=1:RETURN
890 SOUND 0,I,10,10:SOUND 1
    ,I-2,10,6
900 FOR I=1 TO J:FOR K=1 TO
     LS:NEXT K:NEXT I:SOUND
     0,0,0,0:SOUND 1,0,0,0
910 FOR I=1 TO LL:NEXT I:GO
    TO 860
920 RESTORE 1020:LS=12:LL=1
    2:GOSUB 850
930 IF FL=1 THEN RETURN
940 RESTORE 1040:GOSUB 850
950 IF FL=1 THEN RETURN
960 RESTORE 1020:GOSUB 850
970 IF FL=1 THEN RETURN
980 RESTORE 1050:GOSUB 850
990 IF FL=1 THEN RETURN
1000 FOR I=1 TO 300:NEXT I:G
     OTO 920
1010 DATA 243,4,243,4,243,1,
     243,4,204,4,217,1,217,4
     ,243,1,243,4,255,1,243,
     6,3,3
1020 DATA 243,1,217,1,204,1,
     182,1,162,1,204,1,162,1
     ,0,1,173,1,217,1,173,1,
     0,1,182,1,230,1,182,1,0
     ,1
1030 DATA 243,1,217,1,204,1,
     182,1,162,1,204,1,162,1
     ,121,1,3,3
1040 DATA 136,1,162,1,204,1,
     162,1,136,4,3,3
1050 DATA 162,1,204,1,162,1,
     121,1,243,4,3,3
1060 DATA 81,4,85,2,102,1,10
     8,1,121,6,108,1,102,1,8
     1,2,81,2,85,2,102,1,108
     ,1,121,8
1070 DATA 108,2,91,2,102,2,1
     08,2,121,1,128,1,121,1,
     108,1,102,2,121,2,81,4,
     102,4,121,8,3,3
1080 REM ** SUBR. TO INDICAT
     E BATS LEFT **
1090 POKE 656,0:POKE 657,6:?
      "          ";:POKE 657,6:F
     OR I=1 TO BN(P):? "+ ";
     :NEXT I:RETURN
1100 POKE 656,1:POKE 657,5:?
      SCORE(P);"     ":RETURN
1110 POKE 656,1:POKE 657,12:
     ? TOTAL(P);"      ":RET
     URN
1120 POKE 656,1:POKE 657,5:?
      "        ":RETURN
1130 POKE 656,1:POKE 657,12:
     ? "          ":RETURN
1140 GOSUB 800:POKE 53278,0:
     SCORE(P)=SCORE(P)+25:GO
     TO 1100
1150 REM ** SUBR. TO REMOVE
     PM GR. **
1160 POKE 53277,0:POKE 54272
     ,0:FOR I=53261 TO 53264
     :POKE I,0:NEXT I:RETURN
1170 REM ** SUBR. TO INSERT
     PM GR. **
1180 POKE 53277,3:POKE 559,4
     6:START=(PEEK(106)+1):P
     OKE 756,START
1190 REM ** ALTER DISPLAY LI
     ST **
1200 A=PEEK(560)+256*PEEK(56
     1)
1210 IF PEEK(A)<>66 THEN A=A
     +1:GOTO 1210
1220 POKE A,70:POKE A+3,6:PO
     KE A+4,6:POKE A+5,6
1230 RETURN
1240 REM ** CHANGE CHARACTER
      SET **
1250 POKE 106,PEEK(106)-5:GR
     APHICS 0:START=(PEEK(10
     6)+1)*256:POKE 756,STAR
     T/256:POKE 752,1
1260 ? "INITIALIZING ......"
1270 A=USR(ADR(ZZ$),57344,ST
     ART):RESTORE 1300
1280 READ X:IF X=-1 THEN RES
     TORE :RETURN
1290 FOR Y=0 TO 7:READ Z:POK
     E X+Y+START,Z:NEXT Y:GO
     TO 1280
1300 DATA 32,255,255,127,127
     ,126,62,62,60
```

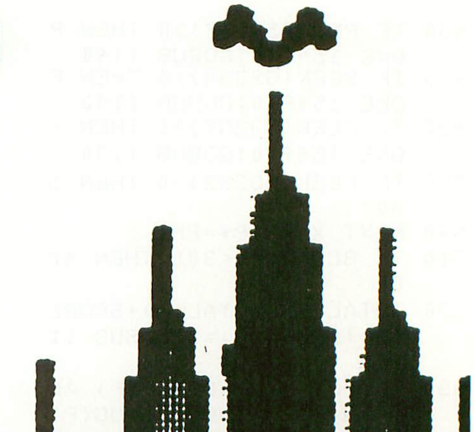
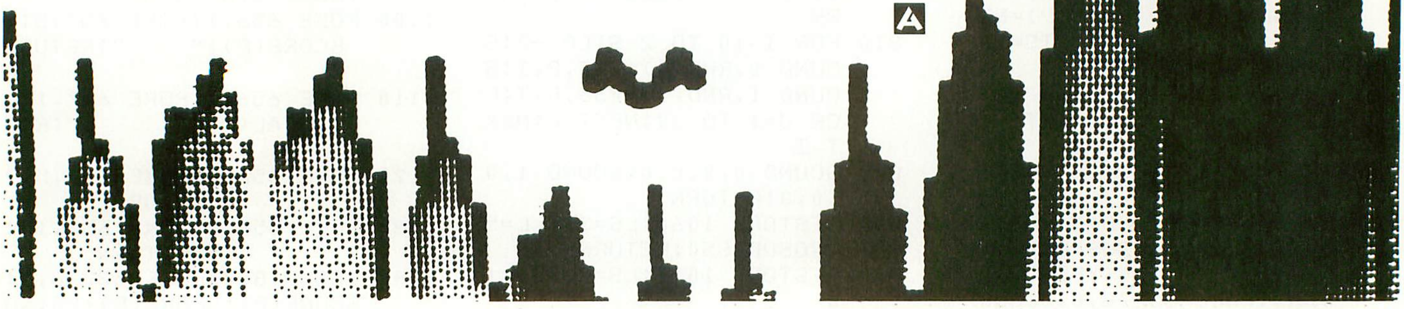
continued on next page

```
1310 DATA 40,60,28,28,24,8,8
,8,8
1320 DATA 48,255,127,126,60,
56,24,8,8
1330 DATA 56,8,24,28,124,124
,254,254,255
1340 DATA 64,60,126,126,126,
126,126,127,255
1350 DATA 72,16,16,16,16,16,
24,60,60
1360 DATA 80,255,255,255,255
,255,255,255,255
1370 DATA 88,0,24,24,165,165
,66,66,0
1380 DATA -1
```

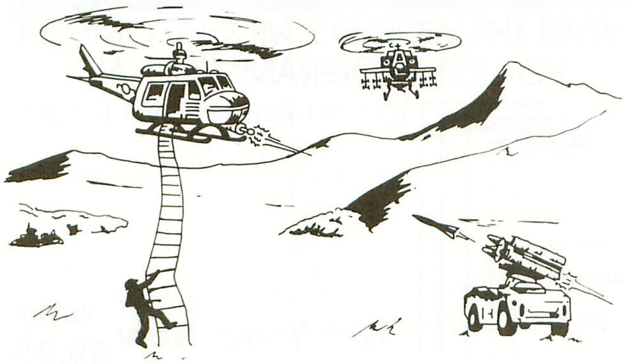
TYPO TABLE

Variable checksum = 1034021

Line num range	Code	Length
10 - 100	TS	533
110 - 210	MF	547
220 - 290	IE	551
300 - 410	BY	518
420 - 510	IS	502
520 - 600	ZA	550
610 - 690	OD	582
700 - 810	CO	606
820 - 920	WH	514
930 - 1040	XM	444
1050 - 1120	KM	509
1130 - 1220	GL	520
1230 - 1340	WB	463
1350 - 1380	GM	112

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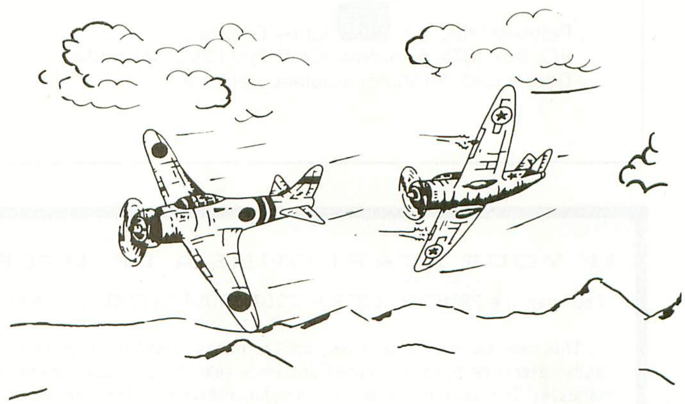
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Tale of Two Circuits

by CARL M. EVANS

Last time we discussed cassette tapes for the ATARI 410 Program Recorder, and concluded that mediocrity *is* best when choosing a brand. This issue we will look at the 410 Recorder itself, and explain how data (your program) is transferred from the computer to the recorder and back again. I'll explain why you can't use just any cassette recorder with your computer, and describe the amazingly simple, yet subtly sophisticated design of the ATARI 400/800 input/output for cassettes.

The 410 Recorder is a stereo (two-track) machine that has been specially adapted for use with the ATARI 400/800 home computer. The usual tone and volume controls have been eliminated and these values preset at the factory. The controls left for the user are RECORD, PLAY, REWIND, ADVANCE (fast-forward), and STOP/EJECT. Some models also have a PAUSE button. The interface cable is permanently attached to the recorder and has a sealed connector on the other end. This connector plugs into the PERIPHERAL opening on the computer, or into the 850 Interface Module, or into the back of the 810 Disk Drive.

If you looked inside the recorder's plastic case, you would see a capstan drive mechanism, a small transformer and a circuit board. This board is the heart (or heart-break) of the 410 Recorder. The size of the board varies in some models, but in mine it measures five-by-five inches. There are only a few dozen electronic parts on the board, barely enough for a board a third that size.

Atari does not publish its schematics so I had to trace out the board myself. In the next issue I will show you this schematic, and tell you how to improve the Recorder's reliability.

There are two separate circuits on the board. The first is for handling the "record" function. This is a simple circuit much like it would be in any cassette recorder. It works reasonably well and is not to blame for most cassette loading problems. Loading problems are almost invariably caused by the "playback" portion of the circuit board. We will go into this topic in more detail next time.

The POKEY chip in the ATARI computer generates a "pure" FSK signal that varies in frequency to represent Zeros and Ones. These tones are recorded on the digital data track of the tape with only moderate distortion. When you load a program into your computer from tape, however, the tones have to be converted to a binary serial data stream before the computer will be able to receive and understand them. This translation process is the primary function of the second circuit on the board, the "playback" circuit. Among other things, playback passes the tones on the tape through a couple of filters that are sensitive to specific tones and will convert them to the appropriate serial data values. These filters operate on a window, or bandpass, technique that is supposed to react only to the specific frequencies involved.

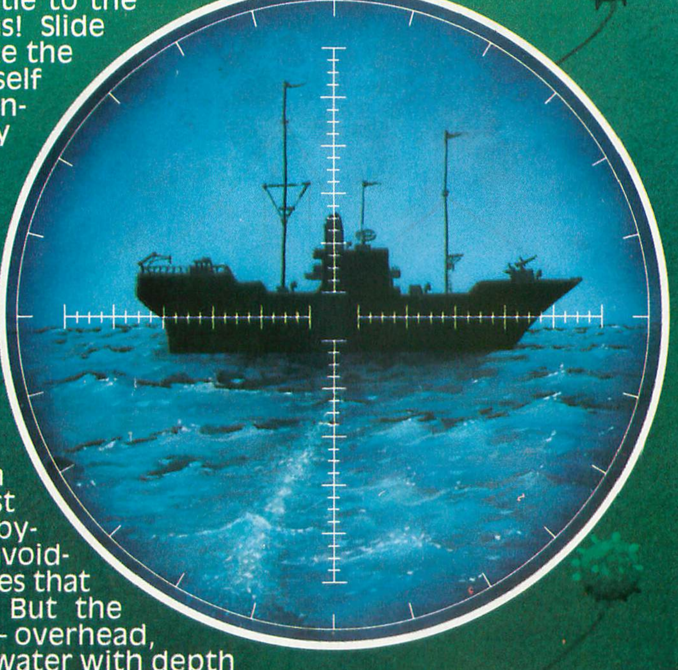
Most loading problems can be traced to some deficiency in this translation process. The filters in the 410 Recorder are not precision filters and the recorded tones are not necessarily pure by the time the playback circuit sees them.

Why can't you use just any cassette recorder with your computer? A normal cassette recorder, even an expensive one, is designed only to produce output similar to its input. If you recorded an FSK signal on one of those recorders, you would only be able to get an FSK signal out of it. Since your ATARI expects to receive a serial binary data stream, the computer would never recognize the data. The only way you will ever be able to use a normal recorder with your ATARI is if someone designs a translator that converts the FSK signals into the appropriate serial binary data.

Because of the lead time necessary in magazine publication, I am writing this article without really knowing what you readers are having problems with. Until I hear from you I assume that most of your problems are similar to those that I have experienced. If you have had a particularly aggravating problem with your cassette system, write to me in care of ANTIC and I will try to give you a helping hand.

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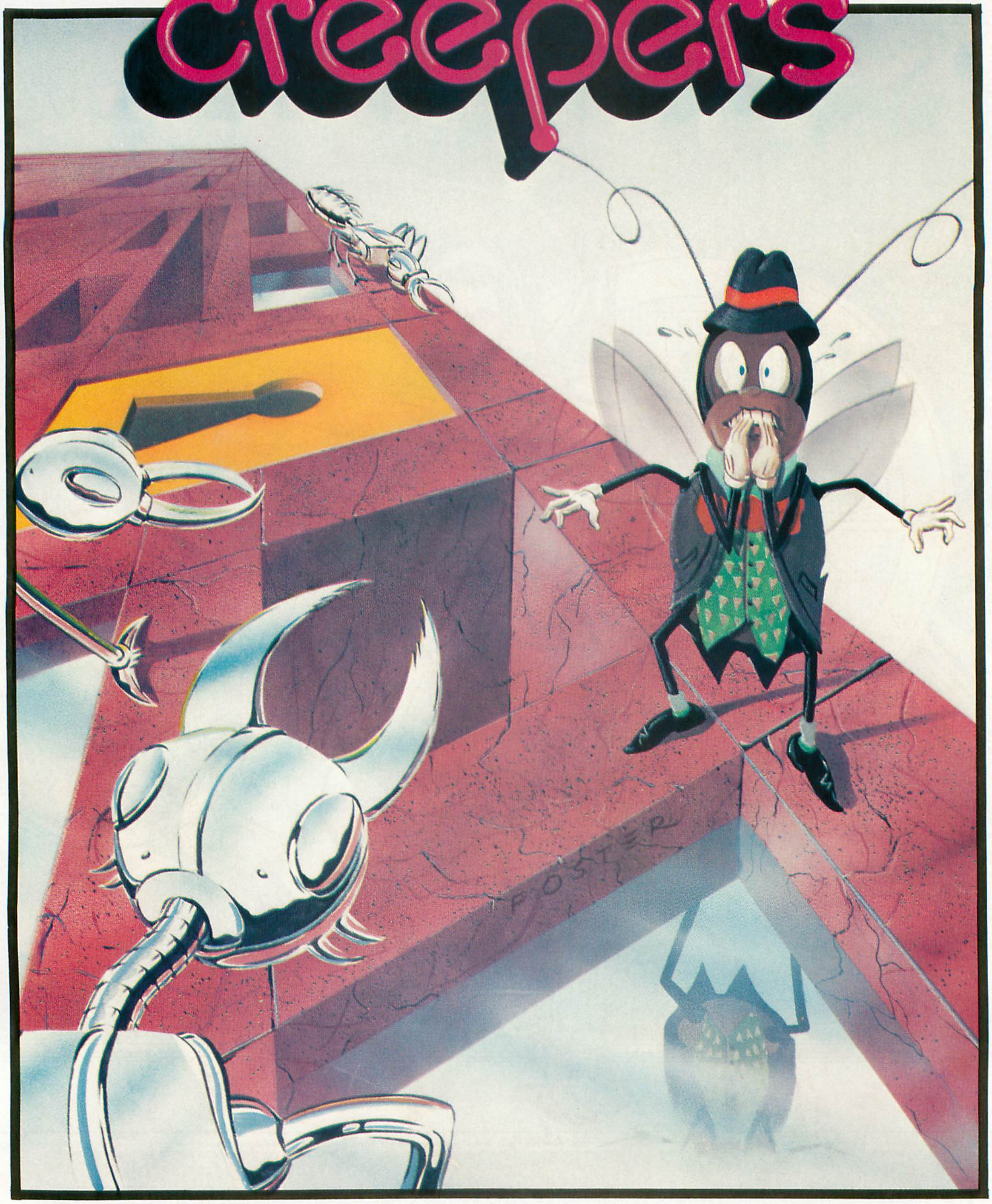
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by James Albanese

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CHRISTMAS MAILING LISTER

by BILL LUKEROTH

Exchanging Christmas cards helps make this time of year special, but digging through old slips of paper to find your addresses can take the fun out of it. Hand addressing all those outgoing envelopes is no thrill either. This year let your ATARI start handling this chore.

"Christmas Mailing Lister" is a cassette-based program that stores up to 140 addresses. You can create, change, or delete addresses at any time. You can print individual addresses, selected categories, or the whole file, sorted alphabetically by name or city. The printout can be done on labels, if you have the proper supplies and equipment, or in the form of an address book.

The unique feature that makes this nice for a Christmas list is that names are sorted beginning with the letter entered in inverse video, rather than the first letter of the name field. This way your labels can read "John and Mary Smith," or "The John Smith Family," instead of "Smith, John and Sue," or "Smith Family, The John." Just type the capital "S" in inverse video. Unforunately, this sort only works when running the whole list. An individual search for the Smith entry would still require hunting for "John and Mary Smith." "Smith" alone would not be enough.

You can also define up to six different categories for selected sub-sorts. Each name must belong to one category only, although this assignment may be changed at will. One possible use for the categories is to keep track of card exchange. For example, the categories could be defined as follows:

1. sent us a card in 1981
2. sent us a card in 1982
3. sent us a card in 1983
4. sent us a card in 1984
5. sent us a card in 1985
6. did not send card

This should keep you organized for a few years, by which time you'll probably have a disk drive and a store-bought program.

This program requires a printer, a 410 Program Recorder, and at least 32K of RAM. The first step is to type the program into the computer. I recommend that you CSAVE to your permanent cassette and a backup before attempting to RUN the program. Note that "Merry Christmas!" in line 250 must be in upper-case inverse video.

When you RUN the program, first you'll see the title page, which changes to a menu after twenty seconds. You can shorten the wait by pressing [START]. The first four options on the menu require insertion of a data cassette, so the first time through you must select option #5, "create a completely new address list." Then you will define your six categories, each using 25 characters or less. You can bypass the category feature by pressing [RETURN] each time.

The next screen asks for a name, address, etc. Each of the first three fields can hold 28 characters. You can put in a nine-digit ZIP code (or shorter) and an area code with your phone numbers. Sorry, no numerical sorting with this program.

Enter a few addresses, then return to the main menu to experiment with the print, change and delete options. When you understand these, continue to enter addresses until you exhaust your list, or your computer's memory. Then return to the menu and selection option #7 ("end"). You will be prompted to insert a blank cassette so you can record all your data onto tape. Do not use your program cassette for this. Also make a backup tape at this time, it's a lot of work to retype data! Now you can try the other program features without fear.

Tips and Hints

Every printer is different. The Atari 822, or other thermal printer (such as the Alphacom), does not have ready-made label paper. You can still cut and paste your labels though.

The Atari 825 printer, and certain other 80-column printers (such as the Espon), can use fan-fold labels with adhesive backs. Typically these labels are spaced at one-inch (six lines) intervals. You may have to adjust lines 7220

continued on next page

and 7230 of the program to accomodate your labels. LE is the variable that determines the number of blank lines between labels. If you change the value of LE in 7220, you must change 7230 so that LE equals one less than it does in 7220.

```
7720 LE = 2
7230 IF Q2$"Y" THEN ? #2;B4$;NAME$(105,119),
     NAME$(120,120):LE = 1
```

The Atari 820 printer does not work well with fan-fold labels because these are too thick. Try Dennison's "file-folder labels," product number 36-471, that come in rolls of 250 labels.

When you are sorting the whole file, the screen should change color each time a sorting loop is completed. This reassures you that the sort is taking place.

Abort and return features include these: the [BREAK] key is disabled to prevent accidental crashes; YES or NO prompts require "Y," anything else returns to main menu; [OPTION] aborts to main menu, even while printing, except at a prompt. [OPTION] plus [RETURN] escapes a prompt.

ATARI screen editing is always available, but can destroy a screen if misused. [OPTION] will escape to main menu.

Load the data tape according to screen instructions and standard procedures. If there is a tape error, you must "end." The tape can take five to ten minutes to load. A tone alerts you when it is finished.

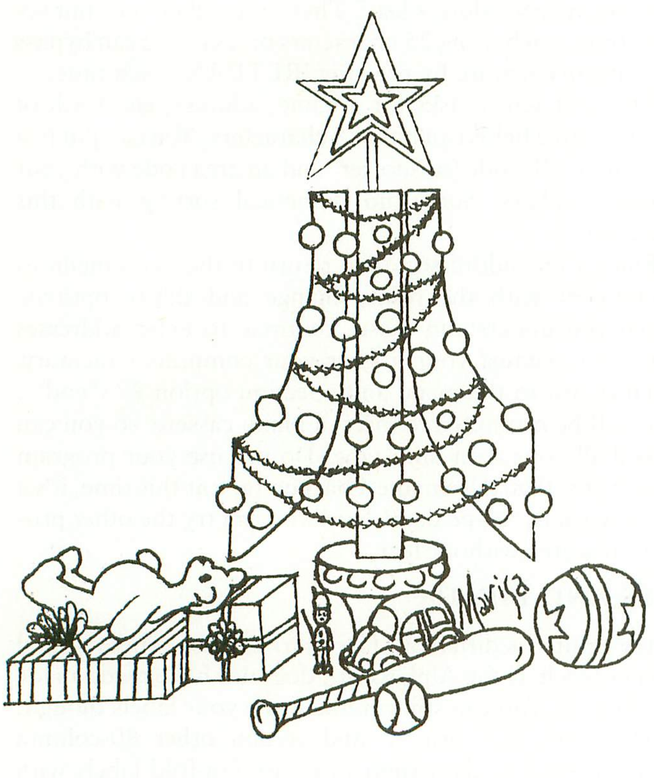
Searching for a single entry requires you to enter the name line, exactly as entered, far enough to make the search unique. Remember, the inverse video character does not function in search mode. If you have "John and Mary Smith" and "John and Milly Doe" in your file, you will have to specify the search at least through the second letter of the woman's name to call the correct record.

If one of us has goofed terribly, the anguished program will go out in a blaze of glory, which should include the offending line number. Note this carefully *and study the* fault. To witness the death scene, type GOTO 9200 instead of RUN. Caution: this will erase any addresses not on tape.

Finally, please consider that this program may not be perfect. If you find flaws, or make improvements, write (don't call) ANTIC, and we will try to respond personally, and through I/O Board, so all can benefit.

May you have a pleasant and prosperous New Year.

See page 90 for listing.



TYPO TABLE

Variable checksum = 6394498

Line num range			Code	Length
100	-	240	WH	529
250	-	320	JM	515
330	-	430	FR	520
440	-	495	LA	501
497	-	590	WP	363
600	-	710	JH	385
720	-	810	RA	531
820	-	970	SP	399
980	-	1110	QZ	385
1120	-	1209	QZ	444
1210	-	1290	RU	499
1300	-	1435	UF	474
1440	-	1506	LJ	449
1510	-	1870	NJ	429
1880	-	2040	IJ	519
2050	-	5000	SU	482
5010	-	5220	DY	603
5230	-	6515	VK	358
6520	-	7010	KZ	453
7020	-	7800	DJ	439
7810	-	9060	LB	356
9070	-	9170	UL	539
9190	-	10000	LU	512
10010	-	10010	PT	36

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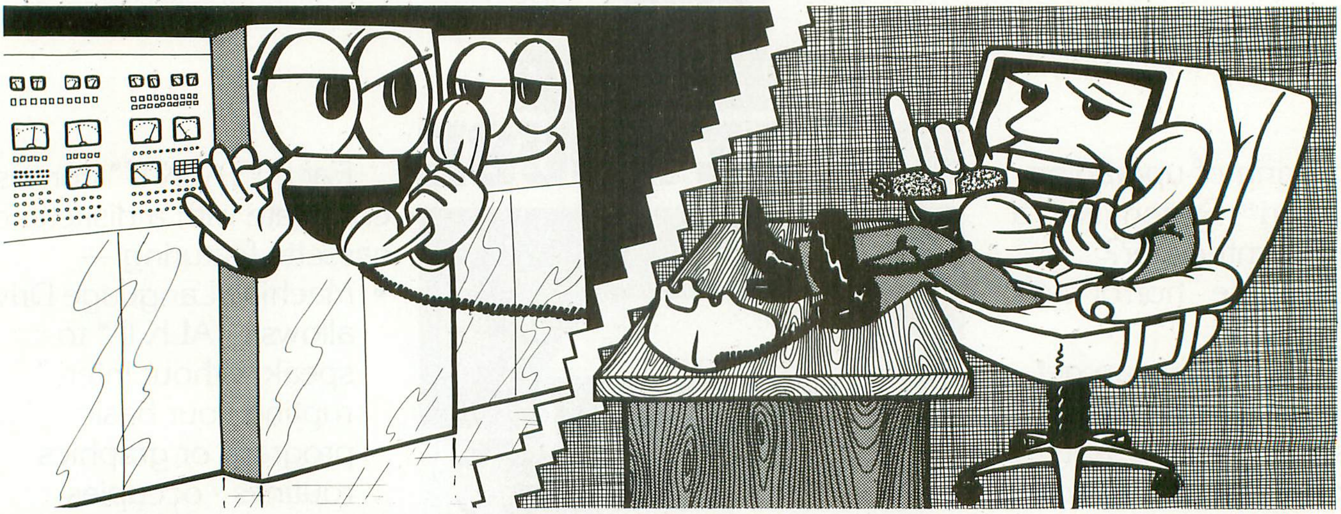
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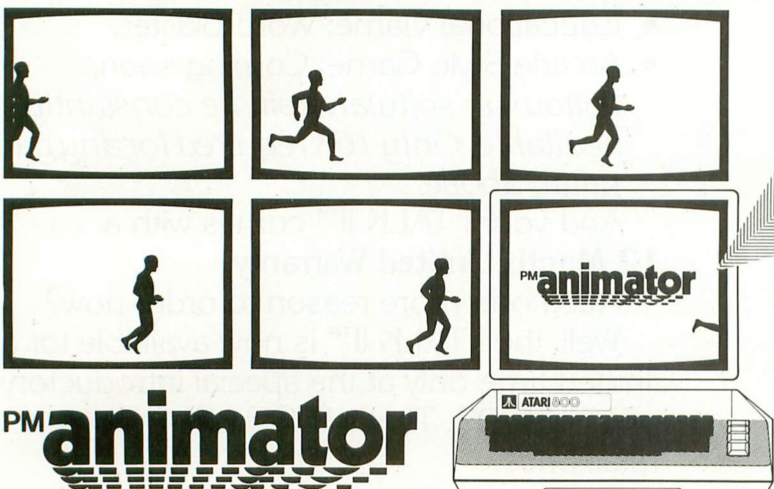
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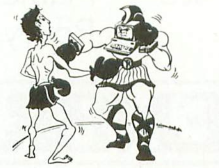
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PRODUCT REVIEWS

BIG MATH ATTACK

T.H.E.S.I.S.
P.O. Box 147
Garden City, MI 48135
(313) 595-4722
$20.00 cassette, 16K
$25.00 disk, 24K
Reviewed by Ken Harms

The educational potential of the ATARI computers is just beginning to be explored, but a few software companies are already producing educationally-sound programs for in-home users. Big Math Attack is one of these, an animated drill for addition, subtraction, multiplication and division problems at the second through fourth grade levels.

Although a simple program designed to teach simple math skills, Big Math Attack is educationally sound. It rewards success, is simple to operate, reinforces correct answers, corrects incorrect answers, and encourages students rather than insulting them. Big Math succeeds in a way very important to a parent who doesn't want to force a child to use an educational program — it's fun to play. I tested the program in three households with kids in grades two through four. All reported that the game was played spontaneously. The kids' reaction was typified by one child who told his father "the computer says I can do it, Dad". He had previously quit a different drill program after it told him he did "dummy" work!

Big Math uses the "Missile Command" approach. A missile flys overhead and drops a math formula, like 2+2. To build up a score, the "player" enters the answer before the formula "lands" on a city. The computer tracks landings and terminates the game after five wrong answers or 5000 points (a long time!). A scrolling reward message encourages even the worst score with "keep trying . . . you can do it".

Two difficulty levels are provided for each math function. Level One provides problems in the 0 to 10 range; Level Two uses the rest of the two digit numbers. Level Two sprinkles enough easy problems in the material so that the advancing child will feel comfortable leaving Level One. The graphics and sound features are good enough for the purposes. The tape version provides a musical background during program loading.

I saw only two flaws in Big Math Attack, both minor. It would be nice to be able to stop a drill easily and go to another. Currently, you have to BREAK the program and re-RUN it. Also, some ability to correct a wrong answer, rather than wait helplessly as the formula descends, would be super.

MOSAIC ADAPTER

MOSAIC Electronics
P.O. Box 708
Oregon City, OR 97045
(800) 547-2807
$80.00
Reviewed by Jim Capparell

This board replaces two Atari 16K memory boards. Simply unplug your old boards, remove the 4116 chips from their old sockets and place them in this well designed card and you've freed one slot of your 800. This is welcome by those of us who purchased our equipment before there were add ons such as the Bit3 board or the Axlon RamDisk. These boards also have gold-plated connectors, which add to their inherent reliability. The exchange only takes 15 minutes and is worth while.

FROGGER

Sierra On-Line, Inc.
36575 Mudge Ranch Rd.
Coarsegold, CA 93614
(209) 683-6858
$34.95
32K Diskette, 16K Cassette
Reviewed by Ron Mitchell

FROGGER introduced a new idea in arcade games, to move the player across successive bands of hazards. This translation for the ATARI by Sierra On-Line is faithful to the original in concept and execution. The graphics and game sounds are superb, but the music gets monotonous. On-Line gets bonus points for enabling [SELECT] to turn the music off without affecting game sounds.

This is a one-player game, and the object is to move the frog across a road and a river without being killed by the traffic or drowning. The hopping frog is controlled by a joystick programmed to require discrete movement for each hop. This frustrated me more than did the continuous-movement program of some similar games.

The frog must hop successfully between vehicles to cross the four-lane road, then cross the river by hitchhiking on the backs of turtles, logs and crocodiles. The crocs occasionally eat the frog, and the turtles sometimes dive when the frog is riding. Both are fatal to the frog, and

continued on next page

when he is killed an ambulance comes by to haul off the cadaver. At higher levels a poisonous snake patrols a formerly safe zone. FROGGER plays at two speeds, and the slowest was plenty fast for me.

As a one-player game, FROGGER saves the high score. You compete essentially against yourself, or against another player by taking turns. Although not unique anymore in the world of games, FROGGER is, nevertheless, a classic to be enjoyed for a long time.

SIDEWRITER

Screen Sonics
14416 S. Outer 40 Rd.
Chesterfield, MO
(314) 434-0433
$249.00 Installed
$238.00 Kit
Reviewed by Steve Randall

Membrane keyboards may have their advantages, but entering code is not one of them. Now all those ATARI 400 owners who want a real keyboard can have a good one. Screen Sonics has introduced a custom-designed and molded full-typewriter keyboard called the Sidewriter.

The Sidewriter is not an ATARI 800 keyboard on a makeshift frame, but a custom-manufactured unit, which, except for one key, duplicates the 800 keyboard. The exception is the Atari logo key (inverse video), which for obvious legal reasons is labeled the "Sue" key on the Sidewriter. Both the [RESET] and [BREAK] keys require more tension to press than on the official ATARI 800 board. The unit's molded case closely matches Atari colors.

The Sidewriter comes with a cable already attached, but the loose end requires opening the computer and doing some soldering. If you follow the instructions carefully, it is really quite simple to install (it took me about 90 minutes), or your local retailer or Screen Sonics can do it for you.

For a minimal charge, Screen Sonics will replace the "Sue" key with one that includes initials of your choice.

Frankly, the Sidewriter is not inexpensive. However, after you see it and use it, you may still find it a good value and a worthwhile investment. Now, about that monogram . . .



EP-CYG-4

BRAM, Inc.
18779 Kenlake Place N.E.
Seattle, WA 98155
(206) 644-3425
$32.95
24K Diskette, 16K Cassette
Reviewed by David Duberman

Attack at EP-CYG-4 is a unique space-war game with a cooperative two-player mode. The game's action takes place above the surface of a planet that has been taken over by a brutal machine race which is threatening the human colony. Your mission is to wipe out all traces of the robot enemy with your five gravitron-drive attack ships.

Each ship's weapon is aimed and fired simultaneously in the single-player mode by depressing the joystick button. In the two-player mode, one stick controls the ship, and the other moves the cursor directing the aim of the weapon.

With the weapon, you must disintegrate enemy structures. Each sector of the battlefield contains ground structures of various sizes, some of which may fire back at you. Enemy ships can attack at any time. Your ship is shielded, but not invulnerable. There are at least thirty sectors in each of the three versions on the game disk. There are three levels of difficulty for each version, and each may be played in one-player or two-player mode.

Your ship's motion is controlled by the joystick in Port 1. Vertical motion is a function of stick position, as in **Missile Command**. However, the stick also controls horizontal velocity so that when you push the stick sideways, you accelerate in that direction. You must push the stick in the opposite direction to slow down or stop. Getting used to this takes a bit of practice, so the programmers considerately made the entry point of each game an enemy-free zone. You are transported to this zone when one of your ships is knocked out — if you have any ships left. When you leave the safe zone again, you bypass all sectors you have cleared previously in the game.

Verbal description cannot really do justice to this game. It provides a lot of value, because of the multiple versions, and because you don't grow tired of it, as with so many other video games. Its really unique qualities, the ship's motion and the cooperative two-player mode, mark its programmers as truly visionary game designers. Unfortunately, they don't receive any credit on the game's rather elegant packaging.

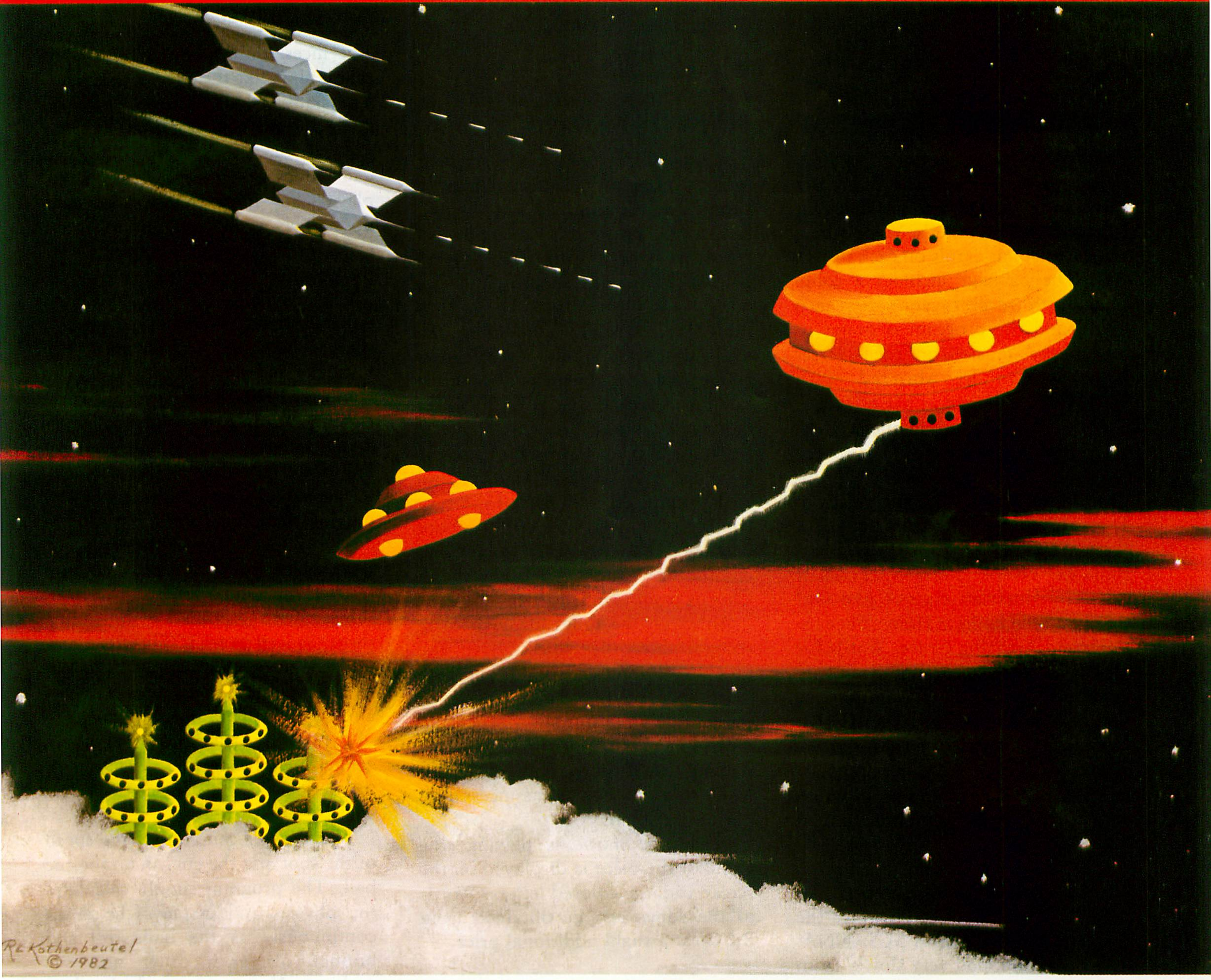
The only version of the game I was able to complete was the least difficult. Once I cleared all sectors of enemy structures, I was slightly disappointed to discover that there was no real ending to the game. I could only keep roaming the sectors or start another game. This is a minor flaw, and I recommend **EP-CYG-4** to any gamer who is looking for new concepts and challenges in his or her gaming life.

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(206) 644-3425

CHRISTMAS MUSIC

Computer's Voice
2370 Ella Drive
Flint, MI 48504
(313) 238-5585
$24.95
16K Cassette, Diskette
Reviewed by Roy D. Wolford

Finally, there is some prewritten music for the Atari Music Composer cartridge, including two packages for Christmas. Computer's Voice offers eight Christmas carols on each of two sets. The package includes a songbook with several verses for each carol, and the program is preset to repeat the music for each verse. Repeats can be aborted with [BREAK], or limited at MENU time.

MUSIC 1 contains 11 music files. Four files are pieces by J.S. Bach, which include two voices of the Brandenburg Concerto #5, four voices of Fugue 16, Praelude 23 from Book 2 of the Well-Tempered Clavier, and Sinfonia #1. The other seven files consist of early American classics like Oh! Susanna, Old Folks at Home, Shenandoah and Amazing Grace. Words for all the music, except J.S. Bach, are contained in the documentation, so you may sing along with the ATARI. For those of you who have forgotten how to use the Music Composer Cartridge, the documentation provides very easy instructions on how to load and play a file.

One error in the documentation was found. You are told to enter filename SUZANNA when in fact the filename on the disk is SUSANNA. The Bach files load very slowly from disk (Brandenburg Concerto #5 takes 2.5 minutes to load). This is no fault of the MUSIC 1 software but rather the limitations of the way the Music Cartridge handles the loading of files.

B.I.G. Software
533 Airport Blvd., Suite 518
Burlingame, CA 94010
(415) 347-1063
$12.95 Cassette — 8K to 32K
$34.95 Diskette — 16K to 40K
Reviewed by Jim Roberts

The novelty of playing Christmas music on your ATARI compuer should add some interest to your holiday scene. Essentially collections of Christmas songs for the four "voices" of the ATARI, these programs are available in several formats. The simplest is a cassette containing ten songs, requiring 8K and a BASIC cartridge to play. At the high end, a three-volume disk requires 40K to select among 30 songs.

The selections are drawn from the standard Christmas repertoire, and each volume mixes a few of the very common carols with a few of the more obscure. There are seven volumes in all, the last featuring the Hallelujah Chorus from Handel's Messiah.

Although the tunes are all clearly recognizable, the voices have the familiar "computer" sound, and lack of liveliness of normal music. So, even though the programs allow repeats of individual tunes, or of the whole volume, it isn't likely that you would want this music playing incessantly during the holidays.

While the music is playing, the name of the piece is displayed on the screen in large colored letters. Words to the songs can be obtained from B.I.G. at a slight additional price.

IDSI POOL

Innovative Design Software
P.O. Box 1658
Las Cruces, NM 88004
(505) 522-7373
16K Cartridge
Reviewed by Robert DeWitt

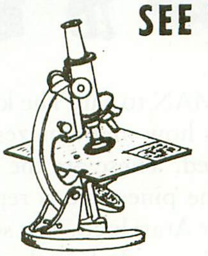
The nicest thing about IDSI Pool is that it plays like the game it simulates. The skills of judging force, distance, angle and the behavior of struck balls are all realistically *involved*. The game does not impose itself on the players any more than a pool table does. This is in contrast to almost every other computer game, where the program *is* the game.

The playfield is a pool table with either 15-ball or nine-ball setups, plus the cue ball. Play is controlled with joysticks and up to four players can compete. The balls are displayed either as "stripes and solids" or individually numbered, although the eight ball is always clearly marked.

The player aims at his target ball by moving an aiming spot to the point of desired impact. The computer calculates which points are possible, and restricts the aiming spot to those locations. This eliminates impossible shots, as well as trick shots like curving around or jumping over a ball to hit your target. A very fine degree of aiming is possible, but the sensitivity of your joystick may make this achievement frustrating. The fire button shoots the cue ball at the target spot.

The shooter can control the speed of the shot and the english on the cue ball. The program simply calculates the physics and displays the result continuously as the balls roll and bounce off each other and the cushions. You may score lucky slop-shots, scratch, or sink your opponent's balls. The program detects scratches and will replace balls sunk, if desired, but the players must keep score.

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by Mark Logies

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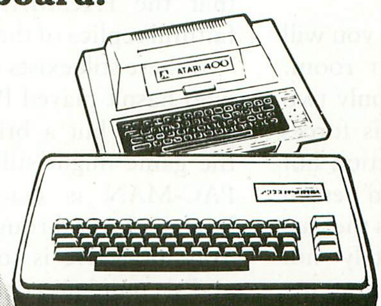
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SHAMUS

Synapse Software
5327 Jacuzzi St.
Richmond, CA 94804
$29.95
16K Diskette, 16K Cassette
Reviewed by Richard E. Herring

On the black level of the Lair, drones move slowly and don't fire often. It almost seems a waste of Ion-SHIVS (Ionic-Short High-Intensity Vaporizers) to disintegrate them; but you shoot anyway. If you don't get out of this room quickly, your archenemy, the Shadow, may come for you.

This scene has become typical around my house as various people take on the role of **Shamus**, the hero of a fast and imaginative new game from Synapse Software. You start in one of the 37 rooms of the black level. The number of the room and the color of the level appear at the bottom of the screen. Points are shown in the upper left corner; extra lives in the upper right corner; and any keys you are carrying in the lower right corner. The color of each key corresponds to the color of the keyhole it will fit. Passing over a keyhole with the proper key will open a new passage.

When you leave one room, you will instantly appear in the next room. Although most rooms have only two exits, a few have three. This forces you not only to pick a direction but also to draw a map. A second person can participate in the game as the cartographer. You will definitely not have the time to do it yourself at any of the three levels after black.

The only problem I could find with **Shamus** is also a feature. When a game ends, the initial screen comes up showing the high score and the score for your last game. Pressing the fire button starts you back in the first room of the Lair. The problem is that when a game ends, you are usually pressing the fire button. If you do not get your finger off the fire button in time, you will restart the game, and miss your score.

You can select any one of four skill levels. The higher the skill level, the faster you and the drones/droids/jumpers will move. At the fastest speed, its tough just to keep from running into the electrified walls.

The game was written in Assembly Language by William Mataga, who did, in my opinion, an outstanding job. If you enjoy fast-paced arcade-quality games with a tinge of adventure, you definitely should add **Shamus** to your game shelf.

PAC-MAN (game)

Atari, Inc.
$44.95 Cartridge (16K required)
Reviewed by Marty O'Donnell

PAC-MAN, the immensely popular arcade game, is now available for the ATARI computers. It comes in cartridge form, and is bound to be one of the major products from Atari in the next few years.

Still, those who remember the disappointing computer version of Asteroids, were prepared to be critical of PAC-MAN. Fortunately, I can report that the PAC-MAN cartridge is a faithful replica of the arcade program.

If there still exists an ANTIC reader who hasn't played PAC-MAN, I'd be surprised, but a brief description of the game might still be appropriate. PAC-MAN is maneuvered by the human player through a maze of dots. Your objective is to eat all the dots and accumulate as many points as you can. The maze is inhabited by four goblins, who run around the maze trying to catch you. However, you can turn the tables on them by eating an energizer which will allow you, for a short time, to catch them.

Atari PAC-MAN is an excellent reproduction of the standup version. The maze is the same, except that it is flattened to fit on a standard TV. Images of fruits occasionally appear for the PAC-MAN to eat. The kind of fruit indicates how many mazes have been completed. These are the same, except that the pineapple is replaced by the familiar Atari logo. The sounds are very similar, including the introductory tune and the siren type background sound. Even small details like the movement of the goblins' capes are duplicated in this cartridge.

The manual that accompanies the PAC-MAN package is a departure from Atari's usual practice of aiming its documentation at a total beginner. The small booklet is a strategy lesson as much as it is an instruction manual. This is just as well, because most people who will buy it have probably played or seen PAC-MAN before.

My only complaints about Atari PAC-MAN are the lack of "commercials" between mazes (this was probably due to memory limitations) and that the coloring of the goblins' eyes is missing. Still, I would recommend Atari PAC-MAN over Ghost Hunter or Jawbreaker to someone who is looking for the best copy of the original.

Atari PAC-MAN can be played by one or two players (taking turns), and you may skip to any skill level (fruit), providing a challenge for even the most experienced player. This is a "must have" item for any ATARI user who enjoys video games.

SYN-ASSEMBLER

Synapse Software
5327 Jacuzzi St., Suite 1
Richmond, CA 94804
(415) 527-7751
$49.95 Diskette — 48K
$89.95 Cartridge
Reviewed by Adrian Dery

Synapse has come up with a really powerful Assembler, Editor and machine-language Monitor. All these are in a single program which is available on disk, or by special order on a ROM cartridge.

This Editor does for Assembly programs what the BASIC cartridge does for BASIC programs, and it works much the same way. Additional editing commands include: Auto-Line Numbering; Renumber (all or part of a program); Delete Lines; Move and Copy (blocks of lines from one part of a program to another); and Search/Replace (character strings).

The Editor has a unique HIDE feature that will protect a source program in memory. Load or type in a new program, then edit and assemble it completely apart from the program you are hiding. You can then save it, or delete it, or append it to the hidden program.

The Assembler part of **Synassembler** is incredibly fast! I have assembled programs as large as 1500 statements and it's average speed is about 100 statements per second, with the source file in memory and the listing turned off.

An Include feature assembles multiple source files in a single pass. This is useful for picking up "canned" subroutines or things like a list of Operating System equates. It also can assemble very large programs and it is quite possible, and sometimes practical, to have a main program that has only Include statements in it.

The Monitor is a full-featured machine-language debugger. Memory can be displayed, changed or moved around. Registers can also be displayed and changed. Program execution can be traced, or you can single-step through the instructions. There are also some special read/write commands that allow you to directly read and write any disk sectors without opening a file.

Synassembler is a professional development tool for the experienced programmer as well as the beginner. It has an excellent Editor, a very fast Assembler capable of assembling programs of virtually unlimited size, and a Monitor that should serve well in finding the trickiest of bugs. It's a step above the Atari cartridge because of its speed and ability to include multiple source files. **Synassembler** does require 48K and you need a disk drive to take advantage of all its features. If you have the memory and the disk, it is a good value for the money.

SOUND AND MUSIC

Educational Software, Inc.
4565 Cherryvale Ave.
Soquel, CA 95073
$29.95
24K Diskette, 16K Cassette
Reviewed by Cassie Stahl

SOUND & MUSIC is one of a series of "tutorials" by Educational Software, formerly known as Santa Cruz Educational Software. Also known as Tricky Tutorial #6, this program by Jerry White is a friendly introduction to the music capabilities of your ATARI. Jerry starts by walking you through your BASIC sound commands. Along the way he points out opportunities and pitfalls. He proceeds to explain chords, and how to create some major and minor ones. He progresses to a complete song with the warning, "Don't think that you can just add a few lines of DATA and create the Nutcracker Suite!"

It's nice to find a software package with realistic goals. This is, after all, an introduction. You must decide what you want and then create your own music. Because this is basically a self-teaching course, you set your own limits. The program is well documented for easy reference.

SOUND & MUSIC demonstrates the use of nine POKE locations. A utility program allows you to change the value of each location using a paddle controller. The nine locations control four voices. Each location handles either the frequency or the note value. The ninth location controls volume. This is a simple way to create some strange sounds.

By experimenting, you will begin to grasp just what sounds your computer can make, and they *are* diverse. Some sound like flying saucers landing or buzzing through the air. Others sound like the ocean. Some just sound like noise.

The programs are presented in a companion booklet as part of the documentation. This makes it easy to see what makes the sounds happen. The authors include a pre-packaged set of ten sound effects. You can listen to a door bell, a space echo, surf waves, a telephone ringing, and more. I don't want to give it all away. With the remaining sounds you could create a war game. The company invites you to incorporate these sounds into your own programs, and if you have any questions you can contact them directly.

To really get your money's worth you will need to study diligently and learn the different effects available with each type of sound command. If you are fortunate enough to have a strong music background you will be able to understand more fully what is being taught.

Although you really do not need a music background to learn from this program, you will need to know some music terms. You can always purchase a small music book to learn

continued on next page

these basic fundamentals. If you study the internal workings of the programs used to create the sounds you will learn quite a bit. The best thing to do is practice!!

Tricky Tutorial #6 has recently been updated and expanded, retaining the earlier features, and adding Jerry White's "Player Piano." All the Tricky Tutorials are written with the novice in mind, and will easily repay your investment in them.

CHOPLIFTER!

Broderbund Software
1938 Fourth St.
San Rafael, CA 94901
$34.95
Diskette only, 48K
Reviewed by Dave Mentley

Put on your flak jacket and dust mask — it's time to fly a night rescue mission in Choplifter! Broderbund Software's new 48K package is one of the best action-graphics games to date for the ATARI computer. The central feature of Choplifter! is the smooth helicopter routine controlled by the joystick. The vivid details of the background, aircraft and hostages classify this game somewhere between an interactive cartoon and a real-time flight simulator. It is hot!!

The scenario of Choplifter! takes us back several years to the Middle Eastern desert where 64 Americans are being held captive in several sets of barracks. The choplifter arrives on a starry night with a full moon beaming. As pilot, you push the stick forward to lift off in search of the first of four groups. You spot them, find a clearing and land. Be careful not to crush the hostages. As they run towards the rescue chopper, an enemy tank approaches, lobbing artillery shells in your direction. Do you wait for the straggling hostages or take off? It is your decision. Better be safe. There is no time limit so you take this load back to the safe-zone and come back for more. As the last hostage leaves the chopper, he turns to give you an appreciative wave while you lift off for more adventure.

Since you can lift 16 hostages in one load, you decide to venture further into the desert to find more barracks, and more of the 64. Out of the night sky an attack jet spots you and lets loose two air-to-air missiles. They hit home and the chopper crashes to the desert floor in a crumpled heap. One down, two to go.

Choplifter! is really a flying simulation as opposed to a shoot-'em-up game. The joystick trigger allows you to shoot bullets (not missiles) to be used for defense. There are no points to be gained for blasting tanks, jets or air mines. The scoring system consists of 3 numbers displayed across the top of the screen: 1-Hostages killed; 2-Hostages in transit and 3-Hostages rescued. The animation is highly polished, from the chopper rotation and flight, to the running and waving of the micro-sized hostages. The only shortcoming in this **Apple** translation is the programmer's obvious unfamiliarity with ATARI sound ability. Instead of whirling blades and thundering munitions we get timid **Apple** beeps and chirps.

PREPPIE!

Adventure International
P.O. Box 3435
Longwood, FL 32750
(800) 372-7172, orders only
(305) 862-6917, business
$29.95
32K Diskette, 16K Cassette
Reviewed by Robert DeWitt

PREPPIE! might not be what you expected, but you won't be disappointed. Billed as a "Day on the Nasty Nine with Wadsworth Overcash," and with a golfing motif to its art, PREPPIE! suggests an adventure on the links.

Actually, you'll spend all your time in the rough, shagging balls knocked there by the mysterious forces of the malicious Groundskeeper. He goads the lads on, then strips dead Preppies of their Lacoste emblems like a rampaging Indian collecting scalps. The game is much like FROGGER in design and play, and only the elaborate scenario relates the player's challenge to Ivy League sport.

Joystick and fire button are used to maneuver Preppie across several danger zones of crisscrossing hazards. He must retrieve golf balls one at a time from increasingly more difficult placements. Even innocuous lawnmowers are fatal to him, if hit, not to mention bulldozers, golf carts, alligators, tippy canoes, water hazards and a giant frog. Poor Preppie, he gets killed more often than not. Even if he succeeds, the Groundskeeper simply makes it harder for him. It would take a Tommy to conquer all ten levels of this game.

The game is definitely challenging, and the "agony of defeat," thrusts you impatiently back to the [START] button when your current allotment of Preppies have experienced the ultimate mishap. The scoring protocol neatly encourages you to play a little faster than you should, and there goes another Preppie. On the positive side, there is a little thrill in killing off Preppies, even if they are your men. Two players can share this frustration by taking turns. The computer will score for both, and save the high score.

The programming by Russ Wetmore is well conceived and executed. A tune you will associate with the lyrics "Mabel Mabel, sweet and able," accompanies the game incessantly, and eventually the sound has to be turned way down to preserve sanity. The levels of the game are just enough harder each time to keep you from despair.

AI has a real winner here, even if the "cover" concept is only remotely related to the game. The company offers one year warranty on defective media, and will provide one low-cost backup disk to each buyer.

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SOFTPORN ADVENTURE

On-Line Systems
36575 Mudge Ranch Road
Coarsegold, CA 93614
$29.95 diskette
Reviewed by Davey Saba

When you get tired of shoot 'em up attacks, Softporn Adventures by ON-LINE SYSTEMS could be a refreshing break. Since I am not interested in dragons or wizards (forgive me), Softporn is the way I spent my first adventure game dollars. It has been an unusual and entertaining experience.

The object of the game is to meet and seduce three attractive ladies. This adventure takes place in the distant future at the computer-generated city of Las Vegas. You will have to make money to survive, and to buy the affection of the women. There is only one way to make money here — gamble at the casino. The casino offers blackjack and slot machines. The instructions say the odds are better at the slots, but I have made much more money at the 21 table.

Once you acquire a good-sized sum of money, you are on your way. WARNING! Money goes fast here (a shot of whisky is $100), but don't forget it's the year 2020 A.D. The three main places you can go are the casino, the bar, and the disco. You can travel by taxi, or one other clever way, which you will enjoy finding yourself.

When you are killed (and you will be, often), you go to a black purgatory. There you find three doors. One will take you back to the game unharmed, another takes the game to hell (where it's system reset time), and the third leaves you in purgatory. One easy way to get to purgatory is to run out of money, so be careful on that account! There are many other ways to go to purgatory, some unbelievably hilarious! Softporn uses the standard two-word command situation, and sometimes your language will get you into trouble.

A small instruction folder accompanies the diskette, and gives minimal directions to get started. From there you are on your own. Even though my favorite game is still Centipede, Softporn is a welcome addition to my software library. May Lady Luck be with you!



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MASTERTYPE

Lightning Software
P.O. Box 11725
Palo Alto, CA 94306
(415) 372-3280
$39.95
32K — Diskette
Reviewed by Robert DeWitt

Touch typing is a skill almost everyone desires, but it requires a process almost no one wants to go through. MasterType very possibly can change all that. This program teaches typing in a sound manner, and does it in a game format that makes the learning fun.

MasterType makes a game out of learning touch typing. The learner (player) has a spaceship in the center of the screen. The spaceship is "attacked" by waves of enemy words, one from each corner of the screen. Each word is "defeated" by typing it correctly before its missile hits the spaceship. The graphics for the game are good, and sounds are used to help inform the player of the outcome of the keystrokes — a very helpful feature. As a game, MasterType is surely okay, although it could become monotonous if you were not improving your typing skills as rapidly as this program leads you to do. A motivated learner, on the other hand, will probably become fond of the contest.

The one great success of MasterType is that it forces the player to watch the screen rather than the keyboard. If you don't watch the screen you lose the sense of the game, especially the encroachment of the enemy, which is the primary cue for typing the next word. Four enemy missiles advance slowly, but inexorably, towards the spaceship. This requires the brain to shift primary attention away from the fingers to the tactical necessities of the battle, and this is when the finger movements become ingrained and automatic. Very neat.

The learning process begins with the most simple one-letter drills and gradually progresses to a command of the entire keyboard. Eighteen lessons are provided, each with four levels of play. The speed of each lesson is under player control. If desired, you can design your own lessons, perhaps to drill on key combinations you find difficult.

There is a situation in the game where the player, having fallen behind due to an error or two, is about to be overcome by one or more enemy missiles. This panic point seems to elicit all kinds of defenses, like peeking at the keys, and jabbing at them with the wrong fingers. These responses need to be inhibited.

I already knew how to type by touch, but over the years I have lapsed into a bastardized touch-and-peck style. MasterType treated me kindly, but forced relearning of those long-lost motor patterns. So even those of you who only need to improve your typing will be able to benefit from this product.

SPEEDREAD +

Optimized Systems Software, Inc.
10379 Lansdale Ave.
Cupertino, CA 95014
(408) 446-3099
Price: $59.95
16K — Diskette, Cassette
Reviewed by Clyde Spencer

Most of us find that there isn't enough time to read everything we need, or want, to read. One solution is to increase our reading speed. SPEEDREAD + is a computer program that may accomplish this.

It allows your ATARI computer system to function like an electronic tachistoscope. A tachistoscope is a device for displaying words and phrases at various speeds, and is often used to teach speed reading. It turns out that a microcomputer can be more flexible than a conventional tachistoscope and is also cheaper.

The SPEEDREAD + program, distributed by Optimized Systems Software, Inc., was written by Eagle Software Company in Assembly Language.

Available in both disk and cassette versions, the disk version comes with two diskettes; one containing the program and sample text and the second disk contains just the text. The text is from three classic short stories: "The Outcasts of Poker Flat", "Rip Van Winkle", "The Legend of Sleepy Hollow". You can prepare additional text if you own a modem, assembler/editor program, or a word processor.

The program is menu-driven with several levels of menus, but you can not go backward. To start over you must go to the end of the selection, but you can change the speed or line width. The program offers reading speeds from five words per minute to 5000; the beginning default is 100 WPM. The speed can be changed, while running, with either a joystick or the [F] and [S] keys on the keyboard.

The program offers single and double phrase mode as well as random location and column display, all with variable selection of width from the keyboard or joystick. The column display has right and left justification except in very narrow mode. The various displays are used to develop different skills such as rapid recognition, peripheral vision and rhythmic eye movement.

The manual covers "slow reader" problems and how to overcome them. Daily practice of about 15 minutes for several weeks is suggested for best results.

For the benefit of teachers (speed readers or otherwise), a sample multiple-choice exam on the material is included, plus instructions about preparing your own. The exam is scored by the computer as the student takes it. Up to 16 exams may be created, each with up to 255 questions and as many as six possible answers. The non-programming teacher will, no doubt, find it a Godsend.

DATA PERFECT

FOR THE ATARI 400 AND 800 COMPUTERS

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GENERAL INFORMATION		
Cost of Program	$99.95	
Cost of Utilities Program *(Included In Program)*	$00.00	
Cost of Reports Program *(Included In Program)*	$00.00	
Compatible With Letter Perfect (tm) Word Processing	**YES**	
Menu Driven *(Very User Friendly)*	YES	
Complete Documentation *(Manual Tabbed And Indexed)*	YES	
Single Load Program *(No Swapping Of Program Diskette)*	YES	
Machine Language *(Extremely Fast Operation)*	YES	
Can Use Single Disk Drive	YES	
Can Us Multiple Disk Drives	YES	
Ability To Design Screen Mask *(User Designs Arrangement Of Data)*	YES	
Full Keyboard Editing Available *(Delete/Insert A Character; Go To End/Beg. of Line; Fine 'n', TAB, ETC.)*	YES	
Compatible With Bit 3 80-Column Board *(40-Column and 80-Column Version Available)*	YES	
Works With Any Parallel Printer *(Supports Atari 850 Interface)*	YES	
Totals Of Numeric Field *(Return Total And Average Value/Field)*	YES	
Fail Safes Provided For Data Protection	YES	
Error Messages Displayed	YES	
Status Lines For Ease of Use *(Options Always Available For Reference)*	YES	
SEARCHES AND EDITING		
Multiple Searches Allowed On Same Record *(Search On 9 Criteria Per Record)*	YES	
Search On Two Criteria In Same Field *(Up To 4 Fields In Single Record)*	YES	
Wild Card Searches *(And/Or, Include, Character, Or Block)*	YES	
Search On Basis Of Record Number *(Search For An Individual Record)*	YES	
Search On Range Of Data Desired *(Dates, Numbers, Values, Greater Or Less Than, Equal To, etc.)*	YES	
Editing Of Records Individually	YES	
Editing Records Globally *(Verification Allowed)*	YES	
Delete Records Individually *(Verification Allowed)*	YES	
Deleting Records Globally *(Verification Allowed)*	YES	
UTILITIES SECTION		
Add Fields To Existing Data Base	YES	
Delete Fields From Existing Data Base	YES	
Reformat A Data Base *(Copy Format Of Existing Data Base)*	YES	
Make Additional Copies Of Data Base *(Create Data Base For Extended Records)*	YES	
Sort on Multiple Criteria *(Sort On Basis Of 4 Fields In A Sort)*	YES	
Sorts On Multiple Criteria *(Assending Or Descending)*	YES	
Depth Of Sort Can Be Changed *(Designate Number Of Charters Deep To Sort)*	YES	
Merge Information From Other Data Bases *(Merge Standard Text Files)*	YES	
Add Or Delete Fields From Data Base	YES	
Merge Previous Entered Data From Existing File	YES	
Back Up A Data Base *(Make A Back Up Of Current Source Data)*	YES	
Pack A Data Base *(Remove Deleted Records From Disk Storage)*	YES	

	D.P.	FILE MANAGER "800"
REPORT GENERATOR		
Design Report To User Specifications	YES	
Level Breaks Allowed At Users Option *(Up To 4 Level Breaks Per Report)*	YES	
Designate Font To Be Used In Report	YES	
Boldfacing Allowed In A Report *(With Dot Matrix Printer)*	YES	
Mathematical Formulas Allowed In Report *(Example, Field 'x' + Field 'y' = Field 'z')*	YES	
Auto Page Number Allowed In Report	YES	
Auto Date Entering Allowed In Report	YES	
Repeating Characters Allowed	YES	
Optional Level Breaks and Page Breaks When Sort Values Change	YES	
Up To 7 Lines Allowed For Header on Each Report	YES	
Up To 2 Lines Allowed For Detail Information On A Report	YES	
Variable Spacing Allowed Between Data On Items In A Report	YES	
Multiple Fields Allowed In A Report *(Number, Date, Alpha, Formula)*	YES	
Search Criterian Allowed On Report *(Same Criteria As In Editor)*	YES	
Ability To Have "Literal" Data *Printed In A Report*	YES	
Ability To Have "Conditional" Data Printed In A Report	YES	
Use A Default Date Field	YES	
Designate Default Value For Specific Fields	YES	
LABELS REPORT GENERATOR		
Mailing Labels Allowed *(Specifically Designed For Labels)*	YES	
User Designs Data Placement On Label *(One Across Label Design)*	YES	
Multiple Fields Allowed On Label *(Date, Alpha, Numeric, Formula)*	YES	
Repeating Characters Allowed	YES	
Front Designation Allowed	YES	
Print Labels On A Conditional Basis	YES	
Search Criteria Valid On Label *(Same Search Criteria As Editing)*	YES	
MATHEMATICAL ABILITIES		
Basic Math Calculation Addition, Substraction, Multiplication, Division	YES	
Built In Calculator (Automatic) *(Use In Editing, Or Adding Data)*	YES	
Find the Integer Value Of A Numeric Expression	YES	
Find The Log Base 'e' Of 'x'	YES	
Find The Log Base '10' Of 'x'	YES	
Find The Absolute Value Of 'n'	YES	
Exponentential Notation Used	YES	
Find The Square Root Of 'n'	YES	
Formulas Allowed Between Fields [Field × /+ – */] Field y = Field z] [Field × /+ – */] N = Field Y]	YES	
SPECIFICS		
Maximum Number Of Fields Per Record	32	
Maximum Number Of Formulas In A File	16	
Maximum Length Of A Field	127	
Maximum Record Length	511	
Maximum Number Of Level Breaks	4	
Records Per Diskette *(Depends On Length And Number Of Fields)*	VAR.	
Data Bases Allowed On Each Diskette *(Can Be Expanded To Additional Diskettes)*	ONE	
Form Letter Capability *(Compatible With Letter Perfect)*	YES	

LJK ENTERPRIES, INC.
P.O. BOX 10827
ST. LOUIS, MO. 63129
[314] 846-6124



Games for the ATARI

by Elcomp
53 Redrock Lane
Pomona, CA 91766
Price: $7.95
(add $1.50 for handling if ordered from Elcomp)
Reviewed by Guy Hurt

The title "Games for the ATARI" is a little misleading. About 60% of the book consists of ready-to-type listings. The rest is concerned with programming techniques you can use in your own games.

The book assumes you know the rudiments of your computer and BASIC, and that you are ready for more challenging tasks. If you hope to write a game of the kind featured in ANTIC, this book will help.

Several important and perplexing areas are covered, including:

- —Player / Missile Graphics
- —Programming the Joystick
- —Display List Interrupts
- —The Character Set
- —CTIA vs. GTIA programming

These are the kinds of niceties that make computer games fun to play and commercially valuable. This Elcomp book explains them reasonably well, and gives many demonstrative examples. The explanations tend to be short rather than long-winded, but the attentive reader will benefit.

As far as the games themselves are concerned, many are for two-players. Among the titles are Backgammon, Knight Battle, Gunfight, and Ball. Knight Battle is definitely for the advanced programmer, as it is written entirely in Assembly language. There are nine games in all, and any of them can be saved to cassette or disk after entering. This represents a good value, it seems to me.

Those of you limited to 16K memory may have trouble loading some of the games that require transfer of the character set. However, the book includes routines that are supposed to get around this problem.

So, even though "Games for the ATARI" isn't just a book of games, I think it will be helpful for any ATARI owner who is ready to grow.

Visicalc Home and Office Companion

by Castlewitz, Chisauski and Kronberg
OSBORNE / McGraw-Hill Books
$15.95
Reviewed by Paul Hoffman

One of the few "big name" programs available for the ATARI is VisiCalc. Some of us ran out and bought it, based on the articles in the computer magazines (home finance! business planning! not just a game!) and were sorely disappointed when we realized that the spreadsheets we wanted to make did not just fly from our fingertips, and that we had a $150 dinosaur on our hands.

The VisiCalc Home and Office Companion (emphasis on office) does an excellent job of correcting the major drawback of VisiCalc, namely that you have to program it for it to do you any good. The book as 50 preprogrammed, real world examples of what VisiCalc is good for. Each model (which is the equivalent of a program) has a brief explanation, an example of how to put in your own data, and a listing that shows how to type it in.

Looking over the 50 programs in the table of contents, it is easy to see that the authors covered the vast majority of topics with which VisiCalc can be used. These include investments, inventory, sales, personnel, home finance, etc. Nevertheless, even with a book full of examples, it seems to me the program still won't do all that much, and that five $30 games would have gotten much more use from me than VisiCalc ever will. It is interesting to note that the ATARI is not even listed in the book among the computers that support VisiCalc.

Without the book, it might have taken between 30 minutes and two hours to design and enter a simple program. With the book, you only need a half hour to enter the model. Of course, the ideal situation would be for OSBORNE / McGraw-Hill to sell a disk with all 50 programs on it, since they already have them on file somewhere. With all the design of the models paid for, anything over the cost of the disk and advertising would be profit, and they would probably sell thousands of disks, even at $20.

continued on next page

Fortunately, the explanation of each model in the book is good enough for you to decide whether to bother typing it in or not. The authors also did a reasonable job in coming up with examples so that you could decide whether the results were at all meaningful to you. This is the main advantage of having someone else do the work for you.

The weakest part of the book is the fact that they just listed the model as it came out of VisiCalc without pointing out to you the typing shortcuts that would save about a third of your time. Those of you familiar enough with VisiCalc to know how to use the /R (Replicate) function will see how to use it as you are typing in the models in the book, but novices will waste alot of time unnecessarily typing repetitious lines.

The business models are fairly relevant for small businesses that really should be using accounting programs, but are using the ATARI instead. One thing that is interesting is that very few of the book's EXAMPLES go into the highly-touted "what-if" modeling, since these are of minor usefulness to a business that is in its infancy. The authors do not overstate the usefulness of any of the models, and they should be commended for that.

In all, the VisiCalc Home and Office Companion has at least the beginnings of most of the VisiCalc models that you would want. Those of you who have not yet bought VisiCalc for your ATARI should browse through the book before doing so; if you don't find much that interests you, you probably will be disappointed with VisiCalc as well. For those of you with VisiCalc who really want to use it, this book is guaranteed to save you a lot of time setting up your models.

COMPUTE!'s Second Book of ATARI

by COMPUTE! Books
P.O. Box 5406
Greensboro N.C. 27403
$12.95
Reviewed by Dave Duberman

COMPUTE!'s Second Book of ATARI has arrived, and at $12.95 is easily one of the best software packages available for ATARI owners. The book contains twenty-nine articles on BASIC programming, all previously unpublished anywhere. Most include BASIC listings of programs that can be typed in and experimented with by the reader.

Like its predecessor, the *Second Book* is arranged into sections including Utilities, Programming Techniques, Advanced Graphics, Game Utilities, Applications, and "Beyond BASIC." It is spiral-bound, so it stays open easily when your hands are otherwise busy. Material ranges in difficulty from beginner to advanced.

Among the utilities are several which help to make up for deficiencies in ATARI BASIC, such as "Poke TAB in BASIC", and "ATARI BASIC String Manipulation Tricks."

Game programmers will appreciate aid given by E.H. Forester's program "Player/Missile Drawing Editor," which allows you to design players and missiles on-screen with a joystick.

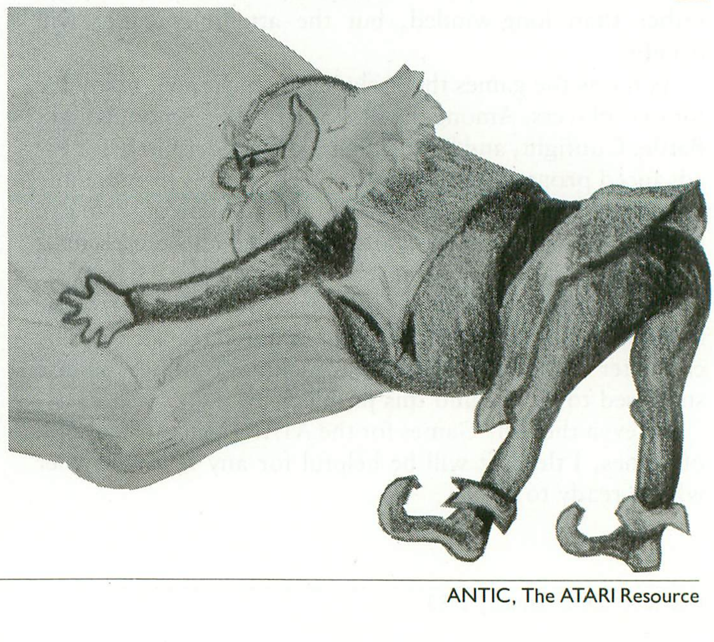
The star of the Graphics section is a 75-page, three-part article by Phil Dunn entitled "Extending Atari High Resolution Graphics." Along with extensive documentation, Phil provides eight separate listings of programs that will let you draw polygons of any shape and fill them with the XIO fill command, create "textured" graphics, and use multi-colored graphics in Mode 8.

David Plotkin's article, "TEXTPLOT Makes a Game," uses the machine language subroutine TEXTPLOT to create a BASIC multicolor action game called "Paratroop Attack," requiring 24K and a paddle controller.

Included in the Applications section are articles such as "A Simple Text Editor," "ATARI Screen As Strip Chart Recorder," and "Perfect Pitch," which allows you to produce high-accuracy sound from your ATARI. Now you can use your computer to tune your piano!

The final section, Beyond BASIC, contains such potentially useful material as "Put Your USR Code Into A BASIC Program Automatically," and "Back Up Your Machine Language Programs With BASIC," which is aimed mainly at cassette users, but contains worthwhile information for most others. "The Resident Disk Handler" is an intriguing introduction to the intricate relation between the operating system and DOS, containing ideas on accessing data stored on disks without using DOS.

All in all, this book is an excellent compilation, extremely informative reading for any computer owner, and a must for owners of the ATARI.



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The expensive Atari* 810 disk drive includes a costly disk controller and power supply for each drive. This is wasteful as one controller can easily control up to four disk drives. With a **MICRO MAINFRAME** drive, you pay only once for the disk controller. To add a second disk drive, you merely purchase a disk drive and case. The power supply in your first drive will power an additional disk drive. Other manufacturers use cheap linear power supplies which generate considerable heat that can shorten the life of your electronic equipment.

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Rancho Cordova, CA 95670
(916) 635-3997

CHRISTMAS MAILING LISTER *continued*

```
100 REM REVISION 0.3,WRITTE
    N 10/07/82
190 DIM BK$(28):FOR L=1 TO
    28:BK$(L,L)="_":NEXT L:
    MSL=15400:REM 140 NAMES
200 DIM MAIN$(MSL),NAME$(11
    0),TEMP$(110),SEARCHNAM
    E$(28),SEARCHCITY$(28),
    FIRM$(28),ADD$(28),CITY
    $(28)
210 DIM ZIP$(10),PHONE$(14)
    ,Q2$(1),CAT$(1),C$(10),
    CAT1$(25),CAT2$(25),CAT
    3$(25),CAT4$(25),CAT5$(
    25),CAT6$(25)
220 DIM CIV$(1),CIV2$(1),NA
    ME2$(110),B4$(6),B$(1):
    B4$="     ":B$=" "
230 FLAG1=0:C$="CATAGORY #"
    :FLAG3=0:FLAG6=0:S=0
240 OOPS=9000:MENU=300:TRAP
     OOPS:DISBRK=9600:REBRK
    =9650
250 GRAPHICS 2+16:SETCOLOR
    2,3,S:SETCOLOR 4,14,0:S
    ETCOLOR 0,3,0:? #6:? #6
    ;"     MAILING LIST ":?
    #6
260 ? #6;"         BY"
270 ? #6;"    BILL LUKEROTH
    "
280 FOR TITLE=1 TO 30:IF PE
    EK(53279)=6 THEN POP :G
    OTO 300
285 FOR LO=1 TO 100:NEXT LO
    :IF S=0 THEN S=8:GOTO 2
    88
287 S=0
288 SETCOLOR 2,3,S
290 NEXT TITLE
300 CLOSE #1:CLOSE #2:GRAPH
    ICS 0
310 ? :? "CHOOSE ONE:":?
320 ? "  1.SEARCH FOR A LIS
    TING(IN ORDER TO
    PRINT A MAILING LABEL,O
    R CHANGE";
330 ? "          OR DELETE A L
    ISTING)."
340 ? "  2.ADD A LISTING."
350 ? "  3.PRINT A COMPLETE
     'ADDRESS BOOK'."
360 ? "  4.PRINT MAILING LA
    BELS FOR EVERYONE
    ON THE LIST."
370 ? "  5.CREATE A COMPLET
    ELY NEW ADDRESS
    LIST(A NEW DATA BASE)."
380 ? "  6.CREATE A BACK-UP
     TAPE."
390 ? "  7.END."
400 ? :? "TYPE 1,2,3,4,5,6
    OR 7":GOSUB DISBRK
410 INPUT Q1:GRAPHICS 0:IF
    Q1<1 OR Q1>7 THEN ? "AN
    SWER MUST BE BETWEEN 1
    AND 7.":? :GOTO 310
420 GOSUB DISBRK:ON Q1 GOTO
     430,430,430,430,1100,2
    020,2000
430 FLAG6=FLAG6+1:IF FLAG6>
    1 THEN 500
440 ? "INSERT THE DATA CASS
    ETTE,REWIND TO    START
    ,PRESS 'PLAY' AND HIT '
    RETURN'"
445 OPEN #1,4,0,"C:"
450 FOR L=1 TO 128:GET #1,D
    UMMY:NEXT L
460 INPUT #1;CAT1$:INPUT #1
    ;CAT2$:INPUT #1;CAT3$:I
    NPUT #1;CAT4$:INPUT #1;
    CAT5$:INPUT #1;CAT6$
470 INPUT #1;TEMP$:IF TEMP$
    =CHR$(253) THEN 490
480 MAIN$(LEN(MAIN$)+1)=TEM
    P$:TEMP$="":GOTO 470
490 SOUND 0,60,10,14:FOR L=
    1 TO 250:NEXT L:SOUND 0
    ,0,0,0:? :? "TURN RECOR
    DER OFF,THEN PRESS 'STA
    RT'  TO CONTINUE."
495 IF PEEK(53279)<>6 THEN
    495
497 CLOSE #1:GRAPHICS 0:GOS
    UB DISBRK
500 ON Q1 GOTO 520,1210,140
    0,1870
520 ? "WHAT NAME ARE YOU LO
    OKING FOR?"
530 INPUT TEMP$:MARK=28:GOS
    UB 8500
540 SEARCHNAME$=TEMP$:TEMP$
    =""
550 ? "WHAT CITY?(OPTIONAL.
    IF NOT NEEDED TYPE'N')"
    ;
560 INPUT TEMP$:MARK=28:GOS
    UB 8500
570 SEARCHCITY$=TEMP$:TEMP$
    =""
575 NL=1
580 FOR L2=NL TO LEN(MAIN$)
    -109 STEP 110
585 GOSUB 7800:IF FLAG4=1 T
    HEN POP :GOTO 300
590 NAME$=MAIN$(L2,L2+109):
    FLAG2=0
600 FOR L3=1 TO LEN(SEARCHN
    AME$):CIV$=NAME$(L3,L3)
    :CIV2$=SEARCHNAME$(L3,L
    3):XN=ASC(CIV$):XS=ASC(
    CIV2$)
605 IF XN<>XS AND XN<>XS+12
    8 THEN FLAG2=1
610 NEXT L3:IF FLAG2=1 THEN
     630
620 NL=L2+110:POP :GOTO 680
630 NEXT L2
640 ? "NO RECORD FOUND.ARE
    YOU SURE THAT"
650 ? SEARCHNAME$:? "IS THE
     CORRECT SPELLING?":GOT
    O 310
680 IF SEARCHCITY$="N" THEN
     750
690 CITY$=NAME$(57,84):FLAG
    3=0
700 FOR L4=1 TO LEN(SEARCHC
    ITY$)
705 GOSUB 7800:IF FLAG4=1 T
    HEN 300
710 IF SEARCHCITY$(L4,L4)<>
    CITY$(L4,L4) THEN FLAG3
    =1
720 NEXT L4:IF FLAG3=0 THEN
     750
730 ? "FOUND ONE IN:":? CIT
    Y$:? "STILL SEARCHING F
    OR THE RIGHT ONE.":? :G
    OTO 580
750 FIRM$=NAME$(1,28):ADD$=
    NAME$(29,56):CITY$=NAME
    $(57,84):ZIP$=NAME$(85,
    94):PHONE$=NAME$(95,108
    )
755 CAT$=NAME$(109,110)
770 GRAPHICS 0:SETCOLOR 2,5
    ,2:GOSUB DISBRK:? B$;FI
    RM$:? B$;ADD$:? B$;CITY
    $:? B$;ZIP$:? B$;PHONE$
    :? B$;CAT$
780 POSITION 2,8:? "DO YOU
    WANT TO:":? " 1.PRINT A
     LABEL":? " 2.DELETE TH
    IS LISTING":? " 3.CHANG
    E THIS LISTING"
790 ? " 4.RETURN TO MENU"
800 ? "CHOOSE 1,2,3 OR 4";:
    INPUT Q2
810 IF Q2<1 OR Q2>4 THEN 78
    0
820 ON Q2 GOTO 840,900,950,
    300
840 GOSUB 7000
850 OPEN #2,8,0,"P:":LABEL=
    0
860 GOSUB 7200
870 GOTO 300
900 ? :? "ARE YOU SURE THAT
     YOU WANT TO DELETE  TH
    IS(ENTER Y OR N)";:INPU
    T Q2$
920 IF Q2$<>"Y" THEN 780
930 GOSUB 7500
940 GOTO 300
950 RESTORE :NAME$="":? "IF
     LINE IS O.K. PRESS RET
    URN.IF NOT    MAKE CHAN
    GES AND THEN PRESS RETU
    RN"
960 ? "(HERE ARE YOUR CATAG
    ORIES:)":GOSUB 6200
970 POSITION 2,0
980 FOR L7=1 TO 6:INPUT TEM
    P$
990 GOSUB 7800:IF FLAG4=1 T
    HEN 770
1000 READ CR,MARK
1010 IF LEN(TEMP$)>MARK THEN
      ? CHR$(253):RESTORE :P
     OP :GOTO 770
1040 IF LEN(TEMP$)<MARK THEN
      TEMP$(LEN(TEMP$)+1)="
     ":GOTO 1040
1045 GOSUB 8500
```

```
1050 NAME$(LEN(NAME$)+1)=TEM
     P$
1060 NEXT L7
1070 MAIN$(NL-110,NL-1)=NAME
     $:GOTO 300
1090 REM Create data base
1100 SETCOLOR 2,6,6:? "THIS
     IS GOING TO ERASE ANY A
     DDRESSES  NOW IN MEMORY
     .IS THAT O.K.?"
1110 ? "(ENTER Y OR N)";:INP
     UT Q2$
1120 IF Q2$<>"Y" THEN 300
1130 GOSUB DISBRK:MAIN$="":?
      "YOU'RE GOING TO HAVE
     TO FURNISH THE   NAMES
     FOR 6 CATAGORIES.IF YOU
      DON'T"
1140 ? "WANT TO NAME A PARTI
     CULAR CATAGORY     JUST
     PRESS 'RETURN'"
1150 ? :? C$;"1";:INPUT CAT1
     $
1160 ? C$;"2";:INPUT CAT2$
1170 ? C$;"3";:INPUT CAT3$
1180 ? C$;"4";:INPUT CAT4$
1190 ? C$;"5";:INPUT CAT5$
1200 ? C$;"6";:INPUT CAT6$
1205 ? :? "DOUBLE CHECK THE
     CATAGORIES,IF THEY   AR
     E O.K. ENTER 'Y',IF NOT
      ENTER 'N'.";:INPUT Q2$
1206 IF Q2$<>"Y" THEN GRAPHI
     CS 0:? "LET'S TRY IT AG
     AIN!":GOTO 1130
1209 REM add a file routine
1210 GRAPHICS 0:SETCOLOR 2,6
     ,2:FLAG1=1:FLAG6=1:NAME
     $="":RESTORE :GOSUB DIS
     BRK
1220 IF LEN(MAIN$)=MSL THEN
     ? "ALL FILES FULL":GOTO
      310
1230 ? "YOU MAY NOW ADD UP T
     O ";(MSL-LEN(MAIN$))/11
     0;" ADDRESSES"
1240 ? "NAME:";BK$:? "STREET
     :";BK$:? "CITY/ST:";BK$
     :? "ZIP CODE:";BK$(1,10
     ):? "PHONE #:";BK$(1,14
     )
1243 ? "CATAGORY:";BK$(1,1)
1245 ? :? :? :GOSUB 6200
1250 OPEN #1,4,0,"K:"
1260 FOR L9=1 TO 6
1265 GOSUB 7800:IF FLAG4=1 T
     HEN RESTORE :GOTO 300
1270 READ CR,MARK:POSITION C
     R,L9:? ":";
1280 GOSUB 5000
1290 NAME$(LEN(NAME$)+1)=TEM
     P$
1300 NEXT L9
1305 CLOSE #1
1310 MAIN$(LEN(MAIN$)+1)=NAM
     E$:? :? "WANT TO ADD AN
     OTHER(ENTER Y OR N)";:I
     NPUT Q2$
1320 RESTORE :IF Q2$="Y" THE
     N 1210
1330 GOTO 300
1390 REM address book
1400 SETCOLOR 2,13,2:? "DO Y
     OU WANT THE BOOK SORTED
      ALPHA-    BETICALLY BY
     :"
1410 ? "1.LAST NAME":? "2.CI
     TY":? "OR":? "3.UNSORTE
     D"
1420 ? "(ENTER 1,2 OR 3)";:I
     NPUT Q5
1425 GOSUB 7800:IF FLAG4=1 T
     HEN 300
1430 GRAPHICS 0:SETCOLOR 2,1
     3,2:GOSUB DISBRK:? "DO
     YOU WANT:":GOSUB 6200:G
     OSUB 6210
1435 GRAPHICS 0:? :? :? "
             PLEASE STAND BY":
     GOSUB DISBRK
1440 FLAG5=1:STR=1:STR2=1:EN
     ND=28:ON Q5 GOTO 1460,1
     450,1800
1450 STR=57:STR2=57:ENND=84:
     REM city$
1460 FOR L15=LEN(MAIN$)-219
     TO 1 STEP -110
1465 SETCOLOR 2,L15/110,L16
1470 IF FLAG5=0 THEN POP :GO
     TO 1800
1480 FLAG5=0
1490 FOR L16=1 TO L15 STEP 1
     10
1500 NAME$=MAIN$(L16,L16+109
     ):NAME2$=MAIN$(L16+110,
     L16+219):IF Q5=2 THEN 1
     510
1503 FOR L21=1 TO 28:CIV$=NA
     ME$(L21,L21):IF ASC(CIV
     $)>159 THEN STR=L21
1504 NEXT L21
1505 FOR L22=1 TO 28:CIV$=NA
     ME2$(L22,L22):IF ASC(CI
     V$)>159 THEN STR2=L22
1506 NEXT L22
1510 IF NAME$(STR,ENND)<=NAM
     E2$(STR2,ENND) THEN 153
     0
1520 MAIN$(L16,L16+109)=NAME
     2$:MAIN$(L16+110,L16+21
     9)=NAME$:FLAG5=1
1530 NEXT L16
1540 NEXT L15
1550 REM sort complete
1800 GRAPHICS 0:Q3=1:Q2$="Y"
     :PAGE=-1:FLAG4=0:OPEN #
     2,8,0,"P:":GOSUB 5200:G
     OSUB 6500
1810 ? :? "DO YOU WANT ANOTH
     ER COPY?":IF FLAG4=1 TH
     EN 300
1820 ? "(ENTER Y OR N)";:INP
     UT Q2$
1830 IF Q2$="Y" THEN 1800
1840 GOTO 300
1860 REM mass mailing
1870 SETCOLOR 2,4,4:? "DO YO
     U WANT MAILING LABELS F
     OR:"
1880 GOSUB 6200:GOSUB 6210
1890 GOSUB 7000
1900 PAGE=-1000:OPEN #2,8,0,
     "P:":GOSUB 6500
1910 GOTO 300
2000 SETCOLOR 2,13,4:TEMP$="
     ":IF FLAG1=0 THEN 4999
2010 ? "SINCE YOU HAVE CHANG
     ED SOME FILES(OR  CREAT
     ED NEW ONES)YOU MUST NO
     W SAVE    THE DATA ON T
     APE."
2020 ? "INSERT THE DATA CASS
     ETTE,REWIND TO    START
     ,PRESS 'PLAY' AND 'RECO
     RD' AND   HIT 'RETURN'.
     "
2025 ? "MAKE SURE THAT YOU U
     SE THE DATA TAPE, NOT T
     HE PROGRAM TAPE.":GOSUB
      5500
2030 OPEN #1,8,0,"C:"
2040 FOR L=1 TO 128:PUT #1,0
     :NEXT L
2050 ? #1;CAT1$:? #1;CAT2$:?
      #1;CAT3$:? #1;CAT4$:?
     #1;CAT5$:? #1;CAT6$
2055 IF INT(LEN(MAIN$)/110)<
     >LEN(MAIN$)/110 THEN MA
     IN$=MAIN$(1,LEN(MAIN$)-
     1):GOTO 2055
2060 FOR L12=1 TO LEN(MAIN$)
     -109 STEP 110
2070 TEMP$=MAIN$(L12,L12+109
     ):IF TEMP$(1,1)="@" THE
     N 2075
2073 ? #1;TEMP$
2075 NEXT L12
2080 ? #1;CHR$(253):CLOSE #1
2090 ? :? "DO YOU WANT TO MA
     KE A/ANOTHER BACK-UP TA
     PE(ENTER Y OR N)";:INPU
     T Q2$
2100 IF Q2$="Y" THEN 2020
2110 IF Q1=6 THEN 300
4999 GRAPHICS 0:? :? "PROGRA
     M TERMINATED.":END
5000 TEMP$="":LNL=1
5010 GET #1,KEY:IF KEY=155 T
     HEN 5080
5020 IF KEY=126 AND LNL>1 TH
     EN LNL=LNL-1:TEMP$(LNL,
     LNL)="":? CHR$(KEY);
5030 IF KEY>96 AND KEY<123 T
     HEN KEY=KEY-32
5040 IF KEY<32 OR KEY>223 TH
     EN 5010
5050 IF KEY>122 AND KEY<160
     THEN 5010:REM ditto
5060 TEMP$(LNL,LNL)=CHR$(KEY
     ):? CHR$(KEY);:LNL=LNL+
     1:IF LNL>MARK THEN 5080
5070 GOTO 5010
5080 IF LEN(TEMP$)<MARK THEN
      TEMP$(LEN(TEMP$)+1)="
     ":GOTO 5080
5090 RETURN
5200 ? #2;"              CATA
     GORY INDEX":? #2
5210 ? #2;"1.";CAT1$:? #2;"2
     .";CAT2$:? #2;"3.";CAT3
```

continued on next page

```
     $:? #2;"4.";CAT4$:? #2;
     "5.";CAT5$:? #2;"6.";CA
     T6$
5220 FOR L18=1 TO 20:? #2:NE
     XT L18:FOR L19=1 TO 40:
     ? #2;"-";:NEXT L19:FOR
     L20=1 TO 5:? #2:NEXT L2
     0
5230 RETURN
5500 POKE 53775,35:POKE 5376
     8,40:POKE 53764,0:POKE
     53766,0:POKE 53773,225
5510 RETURN
6000 FOR L10=1 TO CR:? CHR$(
     31);:NEXT L10
6010 RETURN
6200 ? "1.";CAT1$:? "2.";CAT
     2$:? "3.";CAT3$:? "4.";
     CAT4$:? "5.";CAT5$:? "6
     .";CAT6$
6205 RETURN
6210 ? "7.ALL OF THE ABOVE."
     :? "(ENTER 1,2,3,4,5,6
     OR 7)";:INPUT Q4
6220 RETURN
6500 LABEL=0
6510 FOR L11=1 TO LEN(MAIN$)
     -109 STEP 110
6515 GOSUB 7800:IF FLAG4=1 T
     HEN POP :RETURN
6520 NAME$=MAIN$(L11,L11+109
     )
6525 IF NAME$(1,1)="@" THEN
     6560
6530 IF Q4=7 THEN 6550
6540 IF VAL(NAME$(109,109))<
     >Q4 THEN 6560
6550 PAGE=PAGE+1:IF PAGE=7 T
     HEN PAGE=0:FOR L14=1 TO
      40:? #2;"-";:NEXT L14:
     FOR L15=1 TO 5:? #2:NEX
     T L15
6553 FOR L19=1 TO LEN(NAME$)
     :CIV$=NAME$(L19,L19):IV
     C=ASC(CIV$):IF IVC>159
     THEN NAME$(L19,L19)=CHR
     $(IVC-128)
6554 NEXT L19
6555 GOSUB 7200
6560 NEXT L11
6570 CLOSE #2:RETURN
7000 ? :? "DO YOU WANT THE P
     HONE NUMBER ON THE   LA
     BEL(ENTER Y OR N)";:INP
     UT Q2$
7010 ? "HOW MANY COPIES";:IN
     PUT Q3
7020 RETURN
7200 FOR L5=1 TO Q3
7205 GOSUB 7800:IF FLAG4=1 T
     HEN POP :RETURN
7210 ? #2;B4$;NAME$(1,28):?
     #2;B4$;NAME$(29,56):? #
     2;B4$;NAME$(57,84):? #2
     ;B4$;NAME$(85,94)
7220 LE=4
7230 IF Q2$="Y" THEN ? #2;B4
     $;NAME$(95,108),NAME$(1
     09,109):LE=3
7235 IF Q1=3 THEN LE=3
7240 FOR L6=1 TO LE:? #2:NEX
     T L6
7250 NEXT L5:RETURN
7500 FLAG1=1:MAIN$(L2,L2)="@
     ":REM delete file
7510 RETURN
7800 FLAG4=0:IF PEEK(53279)=
     3 THEN FLAG4=1
7810 RETURN
8495 REM lower case to upper
8500 FOR L1=1 TO LEN(TEMP$):
     T1=ASC(TEMP$(L1,L1)):IF
      T1>96 THEN TEMP$(L1,L1
     )=CHR$(T1-32):NEXT L1
8505 IF LEN(TEMP$)>MARK THEN
      TEMP$=TEMP$(1,MARK)
8510 RETURN
9000 REM error trap
9010 ERR=PEEK(195)
9020 ERRLN=PEEK(187)*256+PEE
     K(186):VV=0
9030 SETCOLOR 2,3,4:? CHR$(2
     53):TRAP OOPS
9040 IF ERR>8 AND ERR<138 TH
     EN 9200
9050 IF ERR=141 THEN 9200
9060 IF ERR<>3 AND ERR<>8 TH
     EN 9080
9070 ? "INPUT ERROR.EITHER T
     HE VALUE WAS      OUTSI
     DE THE EXPECTED RANGE O
     R YOU"
9075 ? "INPUT A LETTER WHERE
      A NUMBER WAS      CALLE
     D FOR.":? :GOTO ERRLN-1
     0
9080 IF ERR<>138 THEN 9110
9090 ? "PRINTER OR TAPE ERRO
     R.MAKE SURE THAT  THE D
     EVICE IS TURNED ON AND
     ALL CABLE"
9100 ? "CONNECTIONS SECURE,A
     ND THEN CHOOSE:":GOTO 9
     130
9110 IF ERR<140 OR ERR>143 T
     HEN 9200
9120 ? "TAPE ERROR.REWIND AN
     D THEN CHOOSE:"
9130 ? "   1.RETURN TO MAIN M
     ENU"
9140 ? "   2.END"
9150 ? :? "(ENTER 1 OR 2)":T
     RAP OOPS:INPUT ERRQ
9160 ON ERRQ GOTO 9170,9190
9170 FLAG6=0:CLOSE #1:CLOSE
     #2:CLOSE #3:GOTO MENU
9190 GRAPHICS 0:END
9200 GRAPHICS 0:SETCOLOR 2,3
     ,0:POKE 752,1:FOR XX=1
     TO 5
9210 POSITION 14,10:? "FATAL
      ERROR":SOUND 0,47,10,1
     0:REM warble sound
9220 FOR YY=1 TO 25:NEXT YY
9230 POSITION 14,10:? "FATAL
      ERROR":SOUND 0,64,10,1
     0
9240 FOR YY=1 TO 25:NEXT YY
9250 NEXT XX
9260 ? :? "FATAL ERROR ";ERR
     ;" AT LINE ";ERRLN:? "D
     EBUG AND RESTART":? :LI
     ST ERRLN:END
9600 REM disable break key
9610 BB=PEEK(16):IF BB>127 T
     HEN BB=BB-128:POKE 16,B
     B:POKE 53774,BB
9620 RETURN
10000 REM supplies data for 1
      ine 1270
10010 DATA 6,28,8,28,9,28,10,
      10,9,14,10,2
```



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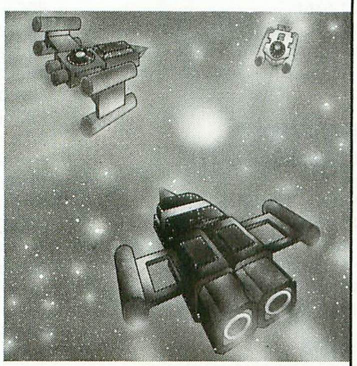
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BUYER'S GUIDE
NEW PRODUCTS



JOYTYPER-400 (keyboard)
Microtronics, Inc.
P.O. Box 8894
Fort Collins, CO 80525
(303) 226-0108
$129.95

This 800-style keyboard mounts on the ATARI 400, replacing the membrane keyboard. Joytyper-400 plugs into the computer — no soldering required. The metal case mounts with adhesive pads, is painted Atari beige, and has a slim appearance.

MINER 2049er (game)
Big Five Software
P.O. Box 9078-185
Van Nuys, CA 91409
(213) 782-6861
$49.95
Cartridge

Dig this maneuver game. The player, a miner, scores points and stays alive by exploring sections of the mine, gathering goods left behind by others, and by crunching "mutants" in their weaker moments. There are ten sections to the mine, each more difficult than the last. The easier sections are even suitable for adults. Cartridge loading makes this a convenient game to play.

I TALK II (speech synthesizer)
Greenbrier Marketing, Inc.
8225 East Rovey
Scottsdale, AZ 85253
(602) 948-0005
$199.00
16K Diskette or
Cassette versions

This speech synthesizer is a hardware item with supporting software on either cassette or disk. It uses Ports 3 and 4 and the parallel connector, for a plug-in-and-go readiness. I Talk II speaks while screen display and other sounds are executed, and uses less system memory space than other synthesizers. Designed specifically for the ATARI computers, it is compatible with all other peripherals and never needs to be disconnected.

AAARRRGGG!!!
ANDROID ATTACK
STARBASE ASSAULT
(games)
Pretzelland Software
2005 Whittaker Rd.
Ypsilanti, MI 48197
$18.95 each
16K — Cassette, 24K Diskette

AAARRRGGG!!! is a game of tag. You're "it" against opponents that appear, then disappear, on the screen. One runs away from you, and some are "poison." Level of difficulty is selectable.

Android Attack is a maze hunt in a nuclear reactor nearing meltdown. The player must negotiate the maze against the opposition of a robot security force, find the valve, flood the maze and escape. Players shoot ala Berzerk.

In Starbase Assault you are the target in center screen with protective shields against the torpedoes of attacking spaceships. When your shielding force is gone, so are you. Score points by destroying your attackers and stay alive as long as you can.

HODGE PODGE
(educational)
Artworx Software Co.
150 N. Main St.
Fairport, N.Y. 14450
(800) 828-6573
$19.95
Diskette

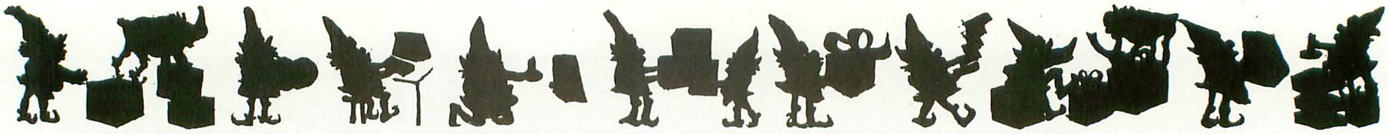
Small children should love this "game." Any keystroke calls up a different screen of animated characters in full color and sound.

Other recent Artworx programs for the ATARI include: Hazard Run (car driving), 16K, $27.95; Beta Fighter (two-player Mars war), 16K, $16.95; Drawpic (create and store color graphics), 16K, $29.95; "T" (text display program), 16K, $17.95; Predictor (multilinear regression), $29.95; and Forest Fire Two (put out fire), 24K, $16.95.

FILEMANAGER +
(data base program)
Synapse Software
5327 Jacuzzi St., Ste. 1
Richmond, CA 94804
(415) 527-7751
$125.00
40K — Diskette
BASIC cartridge required

This upgraded data base program adds computed fields and numerical sorts to the earlier Filemanager 800, with which it is fully compatible. File-

continued on next page



manager + also allows merging entires with Text Wizard from DataSoft. It can also be used with the Axlon RAMDISK. Synapse will soon offer a companion program, Trendmanager, a comprehensive graphics and forecasting program.

SMARTMODEM 1200
(modem)
Hayes Microcomputer Products, Inc.
5835 Peachtree Corners East
Norcross, GA 30092
(404) 449-8791
$699.00

Hayes piles another chip on its stack with this new 1200 baud intelligent modem. It will also handle data transmissions from 0 through 300 baud.

Smartmodem 1200 is compatible with the Bell 212A and the RS-232C standards, and can intermix touchtone and pulse dialing. It is "intelligent" in that it will respond to any programming language, even English word codes. It has autodial and autoanswer features, and the user can monitor the line aurally through a TV speaker. The modem automatically redials when encountering busy signals.

The product is designed to match previous units for a modular, uncluttered look. Status lights on the front panel keep the user informed of all functions.

COSMIC BALANCE
(game)
Strategic Simulations, Inc.
465 Fairchild Drive, Suite 108
Mountain View, CA 94043
(415) 964-1353
$39.95
Diskette, 48K

This game simulates space war of the war-game variety. The player, as commander, chooses many variables before combat, each affecting the outcome of his battle. There is no "best" strategy, just compromises and tradeoffs, that may or may not be justified when battle is joined.

A sophisticated game, it can nevertheless be played quickly, either solitaire or against another player.

EPROM BURNER
(2516 or 2532)
ELCOMP, Inc.
53 Redrock Lane
Pomona, CA 91766
(714) 632-8314
$249.00

EPROM means Erasable Programmable Read-Only Memory. EPROM burners are the devices that make cartridges. If you have created a program and want to make a cartridge version the program can be "burned" into EPROMS (the 2516 or 2532) with this product.

ELCOMP's burner attaches to the ATARI's gameports and comes with operational software.

ELCOMP also sells an inexpensive interface kit ($19.95) to connect the ATARI gameports to an EPSON printer without using the 850 interface.

PREPARING FOR THE SAT
(education)
Program Design, Inc.
11 Idar Court
Greenwich, CT 06830
(203) 661-8799
$125.00
Cassette, 16K

A set of six cassettes prepares students to take the Scholastic Aptitude Test (SAT) and other educational or IQ tests. Topics covered by the cassettes include "Taking Aptitude Tests," "Vocabulary Building," "Analogies," "Number Series," and "Quantitative Comparisons." Some cassettes are available individually.

Each cassette loads into the ATARI 400 or 800 and presents a simulated testing situation. Users are familiarized with typical testing techniques, and trained for high performance. A printed manual "Making the Grade" accompanies the set.

BAYLIS BIG STICK
(joystick)
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P.O. Box 1075
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(213) 247-6484
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Now that's a sturdy joystick! The BAYLIS BIG STICK brings arcade level response and durability to the ATARI game player. This is *the* same mechanism used in arcade machines. Inside, reed switches translate movement into signals for the controller port. Fire button has quick, positive response. Comes in right or left handed versions.

ACR (Atari Cash Register)
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(303) 427-9036
$199.95
32K or 48K — Diskette
Printer required

Record sales and control inventory with this program designed for a small business. Sales transactions produce a receipt or invoice for the customer, a record for you, and data to track 300 inventory items (700 with 48K). Program will give daily, monthly and year-to-date reports.

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Malvern, PA 19355
(215) 296-8467
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Cables to connect the ATARI to a variety of peripherals are available from MNM. These are completely assembled and typically plug into the 810 Interface. Printers for which MNM makes cables include Epson, Okidata, IDS, and C. Itoh. Other printers and peripherals will soon be included. Modem cables are also available, including one for the Hayes Smart Modem.

RASTER BLASTER
(game)
BudgeCo
428 Pala
Piedmont, CA 94611
(415) 658-8141
$34.95
Diskette only

Pinball simulation is the fame of this game. It is done so well that RASTER BLASTER for the APPLE won "Softtalk's" Game of the Year Award for 1981. Now it is available for the ATARI 800 with 32K RAM.

The program imitates the physics of real pinball. "Roll rate" up and down the slant, ball spin, elastic and inelastic bounces, and many subleties of flipper action have been recreated.

Besides that, the game is challenging pinball, incorporating many features of the most modern and complex machines. Multiplayer competition at two levels of difficulty is possible.

P.M.P. 2000 (property
management program)
Talcove & Familian Co.
10902 Riverside Drive
North Hollywood, CA 91602
(213) 501-5845
$199.95
32K — Diskette

If you own or manage property, this program will help you keep track of necessary information and will compute various figures for you. It tracks apartment status, tenant status, cash flow, income and expenses, and your bank account. Developed by a property management firm, P.M.P. 2000 works as a template for VisiCalc.

MUSICBOX (utility)
Program Design, Inc.
11 Idar Court
Greenwich, CT 06830
(203) 661-8799
$29.95
Diskette, 32K

MUSICBOX is a utility program by Jerry White that allows the user to add music to a computer program. The music will play while the program executes, without affecting the program.

The product contains ten music data files that can be loaded by using MUSICBOX. User-generated music files can also be used. The music is produced in the VBI period, so no screen-related functions are affected.

COMPU-MATE CM-1000
(interface)
Compu-Mate Corp.
6305 Airzona Ave.
Los Angeles, CA 90045
$289.00

This peripheral device for the ATARI 400 and 800 replaces the ATARI 850 interface while saving 1762 bytes of RAM.

Compu-Mate uses the ATARI serial I/O port and can be accessed without the hassle of XIO commands. It has the unique ability to translate escape and control codes for many different printers. Output from the CM-1000 is either serial or parallel.

The CM-1000/V ($489) does the same as above, and provides an 80-column by 25-line screen display (fully supporting screen editing and inverse video), that can be dumped to the printer.

Related Compu-Mate products include 64K buffer memory for the printer (CM-20M), and a light pen (CM-30/LP).

Answers and product information from Holiday Crossword on page 21.
Crossword Magic
L&S Computerware
1589 Fraser Drive
Sunnyvale, CA 94087
40K Diskette
$49.95

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ATARI PASCAL (language)
ATARI Program Exchange (APX)
155 Moffett Park Drive, B-1
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Sunnyvale, CA 94086
$49.95
Diskette (two drives required)

Advanced programmers familiar with Pascal may find this product useful. Not a tutorial, not completely debugged, not supported by Atari after sale, this is strictly for the professionals with patience and persistence.

ATARI Pascal is a tool for developing and maintaining programs. It is a multipass, pseudo-code compiler with a modular scheme that provides great flexibility. It also contains many enhancements to UCSD Pascal, with which it is not completely compatible. ATARI Pascal also requires two disk drives to be used.

ACCU/WRITE
(word processor)
DPH, Inc.
1700 Stumph Blvd., Ste. 705
Gretna, LA 70053
(504) 361-8594
$20.00
16K — Cassette

Cassette-based word processors with low RAM requirements are rare in this world, so ACCU/WRITE should be right for someone. The program requires an Epson printer and will work with either the ATARI 400 or 800 supported by the 410 Program Recorder. Versions requiring 32K RAM are also available on cassette and disk at a higher price.

LEGIONNAIRE (game)
Avalon Hill Game Co.
4517 Harford Road
Baltimore, MD 21214
$35.00
16K — Cassette

Legionnaire is a real-time combat game between Caesar's legions and selected barbarian tribes. Designed by Chris Crawford, it is similar to his Eastern Front 1941, but different in that play is constant (real-time) once started. The player, as Caesar, must maneuver his units while the battle rages on an oversized "scrolling" playfield.

PRINTER CONTROL CODE
(reference card)
Optimal Performance
14W Kappas Marina
Sausalito, CA 94965
$3.50

Printers do not always do what you want them to, because they are not receiving proper control codes from the computer. This reference card summarizes the codes for the ATARI 825, Centronics 727, C. Itoh 8510A, Epson MX-80 (including Graftrax), NEC 8023A-C, and others.

FINANCIAL WIZARD
(finance package)
Computari
9607 Athlone
Dallas, TX 75218
$59.95
24K — Diskette

Financial Wizard controls all personal finance needs, including budgetting; check entry; search and balance; check printing (optional); expense analysis and graphic display of 26 categories.



DISKEY

by Sparky Starks

Potential into practical reality. This is the core of DISKEY — a remarkable utility program that gives ATARI disk drive owners the flexibility to accomplish tasks that other utilities either ignored or only hinted at. With DISKEY, the user will be able to actually examine a disk and its directory, and repair some files that might otherwise have been lost. DISKEY also performs a multitude of other practical functions, including the following:

★ Automatically lists any unreadable or destroyed sectors
★ Sends contents of disk to printer selectively
★ Up to four separate drives may be addressed
★ Can be used to backup some of those "un-backupable" disks
★ Allows direct examination of any file
★ Over 50 separate key functions available

As an ATARI 400 or 800 owner, you have extraordinary power and versatility at your disposal. Tap into those resources effectively with DISKEY — new from Adventure International.

ATARI 400/800 32K DISK
052-0158 $49.95
(Note: Some features will require 40K)

SOME OF DISKEY KEY FUNCTIONS

A	Clear screen and filename
B	Byte compare, D1 to D2, OS to DS
C	Copy sectors, OD to DD, OS to DS
D	Toggle destination drive
E	Erase disk (format)
F	Select file sub-menu
L	Set automatic function lower limit (OS)
M	Modify Sector Map
N	New destination sector
O	Toggle originate drive
P	Print screen to printer
Q	Query (search for hex key, drive OD, sector OS to DS)
R	Read new OS, set DS to match
S	Search for ASCII key, drive OD, sector OS to DS
T	Tape to disk
U	Upper case conversion of printer lower case
V	Toggle write verify
W	Write memory buffer to sector DS, drive DD
X	Select EOR Sector Map screen print mask
Z	Zero memory buffer
+	Read upward, next sector on disk
−	Read downward
?	Directory information
!	Select directory sub-menu
cB	Byte compare, D1 to D2, whole disk
cC	Copy D1 to D2, whole disk
cD	Decimal to hex, ASCII conversion
cE	Erase disk (without new format)
cF	Modify sector forward sector chain reference
cH	Hex to decimal, ASCII conversion
cL	Locate bad sector on drive OD
cN	Modify sector file number reference
cO	Select one-drive functions sub-program
cP	Print current Disk Map
cR	RPM test drive OD
cS	Special file copy, no directory reference from source
cV	VTOC update and repair, drive OD
cY	Toggle Sure Response prompt enable
FA	File binary load address headers to printer
FD	Delete file
FF	Select filename for all file functions
FL	Lock file
FM	Show memory address load position in file
FQ	Relative Query
FR	Rename file
FS	Relative Search

BASIC ROUTINES FOR THE ATARI

by Jerry White

Finally, a self-help system that cuts through the stuffy technical jargon and allows the user to learn effective programming techniques fast! BASIC ROUTINES FOR THE ATARI has been written especially for ATARI 400 or 800 users who wish to write programs in BASIC. This package comes complete with an extensive manual and your choice of a tape or disk which contains all of the routines from the manual — which means you'll be able to actually see each of them in action on your ATARI. Some of the BASIC routines include joystick, sound, player missile strings and much more — and presented in a way that you'll quickly be able to learn and apply to your own programs.

If your programming ability lies somewhere between beginning and advanced, then look no further — BASIC ROUTINES FOR THE ATARI is the system for you.

BASIC ROUTINES book with 16K TAPE
051-0154 $24.95
BASIC ROUTINES book with 24K DISK
052-0154 $24.95

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